THE REPORT

OF THE

PRESIDENT

OF

QUEEN'S COLLEGE, BELFAST,

FOR

THE YEAR ENDING MARCH 1, 1860.

Presented to both Houses of Parliament by Command of Her Majesty.

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1860.

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THE REPORT

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THE PRESIDENT OF THE QUEEN'S COLLEGE, BELFAST,

FOR

THE YEAR ENDING MARCH 1, 1860.

TO THE QUEEN'S MOST EXCELLENT MAJESTY.

MAY IT PLEASE YOUR MAJESTY,

This Annual Report which I have the honour of presenting to your Majesty will be found satisfactory and encouraging, both with regard to the steady increase of Students in attendance at the College and to their continued success when thrown into competition with others, for important appointments of various kinds. This increase and the success combined, will afford the best proof of the public advantages of the College, as well as of the general adaptation of its Scientific and Literary Courses to the necessities of the times and the wants of the country.

In my last Report I was enabled to show an increase of 15 Students above those of the former year, now I have to record for the present Session an advance of 32 Students beyond that of the past one; and going back to the Session '52–'53, it appears, as by the subjoined authenticated Table, that from that date to the present, the annual attendance of Students has increased by 101. Thus, in the Session '52–'53, when the College may be regarded as having, for the first time, attained its normal condition, 154 Students were present, whilst in this Session, for so far, they number 255. Some increase may be expected on the opening of the Class of Botany in March.

RETURN of the Total Number of Students attending Queen's College, Belfast, since the year 1852.

Session.	Matriculated.	Non-Matriculated	Total.
1852–53,	101	53	154
1853–54,	114	54	168
1854–55,	118	65	183
1855–56,	119	74	193
1856–57,	136	58	194
1857–58,	153	54	207
1858–59,	160	63	223
1859–60, for so far,	199	56	255

In reference to the above return I wish to draw attention to the circumstance, that the increase referred to is almost entirely amongst Matriculated Students. Thus, in Session '52–'53, 101 Matriculated, 53 Non-Matriculated Students were in attendance; whilst for so far in this Session the numbers are, 199 Matriculated and 56 Non-Matriculated. The same observation applies to the First Year's Students of the present Session.

NUMBER of New Students, or Freshmen, Matriculated and Non-Matriculated, attending Queen's College, Belfast, for the first time in the Session 1859–60.

Matriculated,	65
Non-Matriculated,	22
Total,	87

In this College the greater number of the Non-matriculated Students belong to the Medical Department, which they attend for the purpose of taking their Diplomas in London, Edinburgh, or elsewhere. The following return will show that of the 56 Non-matriculated Students on the rolls of the College 39 belong to the Medical Department, whilst the gratifying fact comes out, that the Medical School at present consists of 95 Students, of whom 56 are Matriculated.

RETURN of the Number of Medical Students in attendance in each Session.

Session.	Matriculated.	Non-Matriculated.	Total.
1849–50,	28	27	55
1850–51,	20	35	55
1851–52,	25	39	64
1852–53,	29	33	62
1853–54,	29	37	66
1854–55,	39	36	75
1855–56,	33	48	81
1856–57,	36	25	61
1857–58,	35	32	67
1858–59,	45	34	79
1859–60,	56	39	95

In addition to the above, there were in attendance on the classes of Chemistry, Natural

History, and Natural Philosophy, some Non-Matriculated Students, who did not declare the object of their attendance.

The great importance of the Medical School and its prosperous condition, induce me, once more to record my deep regret, that the Government have not yet thought it right to respond to the often-repeated applications, made by the authorities of the College for the erection of suitable buildings, within the College grounds, for Anatomical and general Medical purposes. Should the request, which I hereby once more most respectfully renew, be now acceded to, I have no doubt that a large augmentation in this Department would immediately take place, whilst an immense relief would be afforded both to Professors and Students. The Commissioners appointed by your Majesty to inquire into the conditions of the Queen's Colleges in Ireland have, in their Report, sustained, by their strong expression of opinion, the view which, in this respect, I have been the medium of communicating to the Executive and the Government, and which were so clearly stated in the evidence of the Medical Professors.

The Commissioners say:—"No provision was made in the plan of the buildings of any "of the Colleges for the accommodation of the Medical School, or at least a very small "one, in the Colleges. They were, therefore, opened without any proper means for the "accommodation of the Medical School.

"To meet this difficulty at Belfast, a Dissecting room, which belongs to the Belfast Aca- "demical Institution, has been rented by Government; but this Dissecting-room is at "such a distance from the College as to be extremely inconvenient to the Students who "have to pass and re-pass, however inclement the weather, from Lectures in the College "to Dissections in the Dissecting-room. Moreover, it is impossible for the Professor of "Anatomy and Physiology, who is engaged for a great part of the day in the College, to "give the necessary superintendence to the Dissecting Class."

It is to be hoped, that as an excellent Medical School has been established and carried on in this College, notwithstanding the disadvantage of the present Dissecting-room, in which the Students attend the Anatomical demonstrations, being more than a mile from the College where the Lectures are delivered, this impediment to still much greater public benefit and success may be removed, and full encouragement afforded to a Department with which the highest interests of the community are so essentially connected.

A considerable number of the more advanced Medical Students continue to avail themselves of the privilege granted them by the Belfast Board of Guardians, of visiting the patients in the Workhouse Hospital.

While there, each is required by Professor Reid, M.D., to ascertain and state in writing the disease of a patient, the treatment likely to be beneficial, and to write a prescription for the remedies suggested. The papers are then criticised consecutively by Dr. Reid, in the presence of the class.

In giving the Denominational Return, I have only to remark, that the same unbroken feeling of harmony and goodwill that has ever characterized the Students of this College, continues, in the present Session, to produce the same results of preparing young men for acting beneficially together, or with a generous rivalry, in the mixed and varied departments of social life. It is most gratifying to see amongst young men of different denominations a spirit of keen competition for Collegiate distinction, united with interchanges of friendly sentiment, which long outlive Collegiate intercourse.

DENOMINATIONAL RETURN.

	Sessions.			Sessions.	
	1858–59.	1859–60.		1858–59.	1859–60.
Established Church,	45	42	Seceders,	1	1
General Assembly,	132	159	Independents,	2	2
Non-Subscribing Presbyterians,	16	15	Baptists,	–	–
Roman Catholics,	14	16	Various,	1	4
Wesleyan Methodists,	8	8			
Covenanters,	4	8	Total,	223	255

I take the liberty once more of drawing your Majesty's attention to the want of means of remunerating the Deans of Residences, who, by your Majesty's warrant hold their offices, and to the necessity that exists for an alteration in the Statutes of the Colleges which refer to their spiritual supervision over the Students of their respective Churches. My past experience produces an anxiety, on my part, to see this most important department of the College placed on a more satisfactory footing; and so strongly am I impressed with this necessity, that I will solicit leave from his Excellency the Lord Lieutenant to respectfully submit to him my views on the subject. An alteration in the Statutes can only be made by Letters Patent under the Seal of your Majesty.

I annex a Return of the Scholarships of the present year, both allocated and lapsed.

SCHOLARSHIPS awarded in the several Faculties, 1859–60.

7 Senior Scholarships.
26 Junior Scholarships in Arts.
2 Engineering Scholarships.
3 Agricultural Scholarships.
6 Medical Scholarships.
2 Law Scholarships.

LAPSED.

2 Senior Scholarships.
1 Literary Scholarship of Third Year.
2 Science Scholarships of Third Year.
1 Science do. Second Year.
1 Agricul. Scholarship of Second Year.
1 Law do. Third Year.

Merit being made the test on which the Scholarships in the various departments are awarded, the fact that this year eight of those Exhibitions have not been allocated, is a testimony to the faithfulness of the Professors and Council, in adhering to the principle of a high standard of qualification deserving of honour and reward.

I should fail in my duty if I neglected to remark on the peculiar arrangement that exists in the Queen's Colleges respecting these Scholarship foundations. In the greater number of existing Universities, a Scholarship is held not only for three or four, but sometimes for five years, by the same person, whereas in the Queen's Colleges this Exhibition is tenable only for one year. A competition must take place for every Scholarship of the year early in each Session, and the number of existing Scholars can never exceed the number of Scholarships on the foundation, as set forth in the Statutes. This being overlooked, it might be made to appear that the number of Scholars is nearly treble of that at any time existing.

In connexion with the returns of steadily increasing numbers, it affords me high satisfaction to be enabled to record the continued success of our Students in various departments of Competitive Examination, opening channels of advancement to them of a very important kind, at the same time vindicating the claims of the College to hold its position as a seat of general education, amongst the oldest and best known Universities of the empire. Numbers have issued from these walls who have obtained the highest places in the Civil, Medical, and Military services; and their success in the various Examinations required subsequent to their enrolment in each, is a valuable testimony to the soundness and extent of the Scientific and Literary foundations laid in their minds throughout their respective Courses. Our records show a first place at the Woolwich Examination, first in the Inns of Court, London; and more important still, first in the East India Examination. In this last service, adding the two places gained last summer, viz.; the second and the seventeenth, Students of this College have already carried the first, second, fourth, tenth, and seventeenth places in the two years of their competition. In the various departments of the Medical Service our Students have done great honour to themselves and to their Professors.

Materials are not within my reach to enable me to furnish an accurate list of the men who, out of the 944 individual Students instructed in this College, have, by Competition or merit, obtained posts of profit and distinction; but this I hope to have the honour of presenting in the Appendix of my next Report.

It will be observed in the Digest of Subjects in the Appendix that Dr. MacDouall has formed classes for Hindustani and Sanskrit, Rev. Dr. Reichel for Arabic, and Dr. Frings for Italian. These languages being now on the list of subjects prescribed by several public bodies, the Council of the College has had much gratification in according their sanction to the formation of these classes.

In order to extend more effectually to the sons of gentlemen intended for general pursuits or for mercantile life the advantages presented by this College, the Council have this year instituted a Course of instruction of two years' duration, and have undertaken to give a COLLEGE CERTIFICATE OF PROFICIENCY to those who pursue it and comply with the following regulations :—

"I. Students intending to become Candidates for this College Certificate will be required to attend, during at least two Terms in each year of the Course, Lectures on three at least of the following subjects :—

Greek.
Latin.
English Literature.
French.
German.
History.
Oriental Languages.
Mathematics.
Logic.
Chemistry.
Natural History.
Natural Philosophy.
Experimental Physics.
Mineralogy and Geology.
Metaphysics.
Political Economy.
Civil Engineering.
Surveying and Mapping.
Agriculture.
Anatomy and Physiology.

"II. When the Lectures on any of the subjects mentioned in the foregoing regulation extend over one Term only, Students selecting such subject will be required to attend during a second Term Lectures on some other subject.

"III. Students entering for this Course must attend the Lectures and ordinary Examinations of the several Professors, and perform the Class Exercises in the same manner as the Matriculated Students.

"IV. To entitle them to the General Certificate, Students will also be required to pass a final examination in four, at least, of the subjects which they have studied during the Course."

The foregoing scheme having been brought under the notice of the Belfast Chamber of Commerce, that body thought it of such importance that they appointed a special meeting for the purpose of receiving a deputation from the College. At that meeting the following resolutions were adopted:—

> "1. That this Chamber having heard the Deputation from the Queen's College, Belfast, in explanation of a scheme for more effectually extending to young men intended for Mercantile pursuits the educational advantages of the College, express approval of the same, and a desire of co-operating, as far as possible, in carrying out the project.
>
> "2. That, considering the great advantages likely to result from the possession of apprentices of a higher degree of education than is usual at present, this Chamber strongly recommend to Bankers, Manufacturers, and Merchants of Belfast and the neighbourhood, to give their support to the proposed plan by such means as may seem to them desirable, such as giving a preference to those who have obtained the College Certificate, or shortening the term of apprenticeship, &c.
>
> "3. That the best thanks of this meeting are due and are hereby given to the President and Council of Queen's College, Belfast, for the desire evinced by them to extend the usefulness of the College to the Mercantile community."

Although your Majesty's Government have not yet thought it to be expedient to introduce a measure into Parliament for the endowment of Intermediate Schools, I cannot but avail myself of the legitimate channel which this Report affords to me, of expressing my conviction, that until such Schools shall be established in suitable localities, throughout Ireland, the intellectual and industrial resources of the country will be left destitute of the proper means of development.

As the matter at present stands, the Colleges must want their full supply of Students, and the Primary Schools the powers of encouraging their pupils to advance to useful learning of a higher kind, such as Intermediate Schools would afford. Your Majesty's advisers are in full possession of the powerful arguments in favour of the establishment and extension of such institutions; and as it appears, by calculation, that a comparatively small grant in aid of local contributions, would be sufficient to enable Government to lay the foundation of a scheme, which might, from time to time be extended, by granting endowments in particular cases, a strong hope is entertained, that a measure so necessary and certain to be fraught with so many public and national advantages, may be devised and carried out.

In reference to a late Ordinance of the Queen's University in Ireland, prescribing Courses in the Faculty of Arts and amending former Ordinances, and which has just received the official sanction of the Lord Lieutenant, I feel that document to be of such importance as to justify me in embodying it in this Report.

It is necessary to explain that, after most mature consideration and numerous meetings of its members, the Senate of the Queen's University adopted this Ordinance.

Their objects have been to lighten, to some extent, the Courses for the Degree of Bachelor of Arts, where they have been found to press too heavily upon the Students, to afford options of such a nature as will enable them to devote themselves with special earnestness to particular branches, and to divide the Examination for the Degree into two parts, one at the termination of the Second Year's Course, and the other, at the time of Graduation. The preliminary Examination, it is understood, will be conducted within the walls of the respective Colleges. It will further be observed, that for the Degree of Master of Arts, Bachelors in Arts of one year's standing may offer themselves, without any intermediate attendance at the Colleges.

The Course for the Diploma of "Licentiate in Arts," which is to extend over two Sessions, and the subjects laid down for University Examination, will be found, by comparison, to bear a close resemblance to those adopted by this College for the "Certificate of Proficiency," the principal difference being, that the University requires a Matriculation Examination of an easy kind, the subjects of which will soon be announced, whilst the Council of this College has not thought it necessary to require this.

The Examination of Candidates who are not members of the Queen's University presents a scheme similar to that adopted with such admirable success and beneficial results both at Oxford and Cambridge.

In adopting these important changes, rendered necessary by the rapidly advancing condition of Literature and of Science, the Senate of the Queen's University were deeply impressed with the importance of extending the benefits of the Colleges, so as to meet the demands created by the various competitions that now exist for places of trust in the various public departments of the country, and to diffuse more widely the advantages of a sound and liberal education.

I now subjoin the Ordinance alluded to as a substantive part of the Report.

1. Course for the Degree of Bachelor in Arts.

Candidates for the Degree of Bachelor in Arts are hereby required—

1. To have been admitted Matriculated Students of one of the Colleges of the Queen's University in the Faculty of Arts.
2. To have subsequently studied in one of the Colleges of the Queen's University the Course herein prescribed.
3. To have passed the University Examinations herein prescribed.

The Course for the Degree of Bachelor in Arts shall extend over three Sessions, and shall comprise attendance on the following curriculum:—

First Session.

English (One Term).
Greek.
Latin.
Modern Continental Languages.
Mathematics.

Second Session.

Logic (One Term).
Natural Philosophy.

Along with any two of the following:—
Greek (Second Course).
Latin (Second Course).
Modern Continental Languages (Second Course).
Mathematics (Second Course).

Third Session.

English Language and Literature.
Metaphysics, or History, or Political Economy, (Two Terms).
Chemistry.
Zoology, or Botany.

Attendance on these Courses shall, in all cases, be understood to include passing such examinations as may be appointed by the College Council, and the catechetical parts of the Courses of Lectures.

Candidates for the Degree of Bachelor in Arts shall reside at their respective Colleges during at least the first two terms of each Session, but may be exempted from residence during the third term by a special grace of the College Council.

Third year's Students may substitute attendance on one or on two Courses of Honor Lectures, for a like number of the Courses above set down for study in the third Session.

Candidates for the Degree of Bachelor in Arts shall pass two University Examinations—a Preliminary and a Degree Examination.

The Course for the Preliminary Examination shall include Greek, Latin, a Modern Continental Language, and Mathematical Science. Students who have completed their second Session must pass this Examination before rising to the third year, unless prevented by illness or other inevitable accident, in which case the Senate may admit them to a Supplementary Examination.

Candidates who have completed the Undergraduate Course, may offer themselves at the Degree Examination for graduation either with Honors or without Honors.

If they seek to graduate with Honors, they may select for their Examination any one of the following groups:—

Greek and Latin.
Modern Continental Languages.
Mathematical Science.
Experimental Science.
Natural Science.

Or any two of the following:—
English Language and Literature.
Logic and Metaphysics.
Logic and History.
Logic and Political Economy.

Candidates who seek the Degree without Honors, may select for their Examination any group of subjects from the following list, provided the sum of the numbers attached in this list to the selected subjects be at least four:—

English Language and Literature,	2	Botany, ...	1	Logic, ...	1
Mathematical Science, . . .	2	Greek, ...	1	Metaphysics, ...	1
Experimental Physics, . . .	2	Latin, ...	1	History, ...	1
Chemistry, ...	2	Each Modern Continental Language, ...	1	Political Economy, . . .	1
Zoology, ...	1				

English Composition will form a part of all University Examinations.

This Ordinance is binding on all Candidates for the Degree of Bachelor in Arts who have not completed the first year's Course. Students now in their second* or third Session shall proceed under the Ordinances hitherto in force.

2. Course for the Degree of Master in Arts.

Bachelors in Arts of one year's standing, may offer themselves for Examination for the Degree of Master in Arts, and may select for their Examination any one of the following groups:—

Greek and Latin.
Modern Continental Languages.
Mathematical Science.
Experimental Science.
Natural Science.

Or any two of the following:—
English Language and Literature.
Logic and Metaphysics.
Logic and History.
Logic and Political Economy.

This Ordinance supersedes former Ordinances prescribing the curriculum for the Degree of Master in Arts.

3. Course for the Diploma of Licentiate in Arts.

A Diploma conferring the title of Licentiate in Arts of the Queen's University in Ireland, shall be granted to Candidates who comply with the following regulations:—

Candidates for this Diploma are hereby required—

1. To have Matriculated in one of the Colleges of the Queen's University.
2. To have pursued in one of the Colleges of the Queen's University the Course herein prescribed.
3. To have passed the University Examination herein prescribed.

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* Second year's Students may offer themselves for the University Examinations in conformity with the present Ordinance.

The Course for the Diploma of Licentiate in Arts shall extend over two Sessions, and shall comprise attendance on the following curriculum:—

FIRST SESSION.

Two Languages, of which one may be English.
Mathematics.
Another Course on any subject in the annexed list.

SECOND SESSION.

Greek, Latin, or a Modern Continental Language.
Logic (one Term).
Natural Philosophy.
And two other Courses on subjects in the annexed list.

If any of the Courses, except that on Logic, extend over one term only, some other Course from the annexed list must be attended as a supplement to it, but not necessarily in the same Session.

Credit will not be given for attending the same Course of Lectures a second time.

Attendance on the Courses shall, in all cases, be understood to include passing such Examinations as the College Council shall appoint, and the catechetical parts of the Courses of Lectures.

Candidates for the Diploma of Licentiate in Arts shall reside at their respective Colleges during at least the first two terms of each Session.

After having completed the above curriculum, Candidates for the Diploma shall pass a University Examination in Greek, Latin, or a Modern Continental Language; in Mathematical Science; and in two other subjects selected from the annexed list, viz.:—

The Mathematical Sciences.
The Experimental Sciences.
The Natural Sciences.
Geometrical Drawing.
Mensuration, Levelling, and Mapping.
Anatomy and Physiology.
English Language and Literature.
The Modern Continental Languages.
Greek.
Latin.
Logic.
Metaphysics.
History.
Political Economy.

English Composition will form a part of all University Examinations.

Licentiates in Arts who may desire to proceed to the Degree of Bachelor in Arts, may enter directly on the second Session in the Course for this Degree, provided they attend in it, instead of the usual curriculum, all the Courses prescribed for the first two years which they shall not have already attended in the curriculum for the Diploma of Licentiate.

4. EXAMINATION OF CANDIDATES WHO ARE NOT MEMBERS OF THE UNIVERSITY.

Two Examinations shall be held every year, commencing at the same time, for Candidates who are not members of the University.

Examination for First Class Certificates.

All Candidates for the certificate of having passed the more advanced Examination, are here required to satisfy the Examiners in reading English aloud, writing from Dictation, English Grammar, English Composition, Elementary Arithmetic, and Elementary Geography.

Each Candidate must satisfy the Examiners also in at least two of the following sections; a fair knowledge of one of the subjects in each section will enable a Candidate to pass in that section:—

First Section—English.

Any one of the following:—
1. A selection from English History, to be prescribed each year.
2. A selection of English Authors, to be prescribed each year.
3. The Outlines of Political Economy.
4. Geography.

Second Section—Languages.

Any one of the following:—
1. Greek.
2. Latin.
3. French.
4. German.

Third Section—Mathematical Science.

1. Mathematics, or
2. Mathematics and Mathematical Physics.

Fourth Section—Experimental and Natural Sciences.

Any one of the following:—
1. Experimental Physics.
2. Chemistry.
3. Zoology and Botany.
4. Geology and Mineralogy.

Examination for Second Class Certificates.

All Candidates for the certificate of having passed the second Examination, are hereby required to satisfy the Examiners in reading English aloud, writing from Dictation, English Grammar, English Composition, Elementary Arithmetic, and Elementary Geography.

Each Candidate is required to satisfy the Examiners also in one of the following:—

1. Greek. 2. Latin. 3. French. 4. Mathematics.

Candidates may also offer themselves for Examination in German, Mechanics, Chemistry, Zoology, or Botany.

The Degree Examinations shall be conducted in the Hall of the University; the other Examinations in such places as the Senate shall from time to time appoint.

By Order,

Queen's University, January 30, 1860.
G. JOHNSTONE STONEY, M.A., *Secretary.*

CARLISLE.

I, GEORGE WILLIAM FREDERICK, EARL OF CARLISLE, Lord Lieutenant General and General-Governor of Ireland, do hereby approve of the foregoing Ordinance.

By His Excellency's Command,

Dublin Castle, February 11, 1860.
THOMAS A. LARCOM.

All of which is testified, on behalf of the College, by your Majesty's most dutiful servant.

P. SHULDHAM HENRY, D.D., *President.*

QUEEN'S COLLEGE, BELFAST,
March 1, 1860.

APPENDIX.

APPENDIX, No. 1.

Queen's College, Belfast, and Queen's University.

Appendix, No. 1.

Queen's College, Belfast, and Queen's University.

The Queen's College, Belfast, is a Corporation under the name and style of "The President, Vice-President, and Professors of Queen's College, Belfast." It was founded under the provisions of the Act 8 & 9 Victoria, cap. 66, intituled "An Act to enable Her Majesty to endow new Colleges for the Advancement of Learning in Ireland." Under the powers given by this Act, it was determined to found three Colleges. Belfast, Cork, and Galway were selected as the sites of these Colleges; and on the 30th day of December, 1845, letters patent were issued, incorporating them. The Presidents and Vice-Presidents of the three Colleges were formed into a Board, called "The Board of Queen's Colleges," for the purpose of drawing up the Statutes and arranging the system of education to be pursued in them.

On the 4th of August, 1849, the Professors were appointed, and the Colleges opened for the reception of students on the 30th October, in the same year.

Letters Patent, constituting the Statutes, were issued on the 11th of December, 1849.

The Council of the College.

The President.
The Vice-President.
The Dean of the Literary Division of the Faculty of Arts.
The Dean of the Science Division of the Faculty of Arts.
The Dean of the Faculty of Medicine.
The Dean of the Faculty of Law.

Professors.

Literary Division of the Faculty of Arts.

The Greek Language, . .	Charles MacDouall, LL.D.
The Latin Language, . .	Rev. Chas. Parsons Reichel, D.D.
History and English Literature,	George Lillie Craik, A.M.
Modern Languages, . .	Mathias Joseph Frings, Ph.D.
The Celtic Languages, . .	John O'Donovan, LL.D., M.R.I.A.

Science Division of the Faculty of Arts.

Mathematics, ...	Peter Guthrie Tait, M.A., F.C.P.S.
Natural Philosophy, . .	John Stevelly, LL.D.
Chemistry, ...	Thomas Andrews, M.D., F.R.S., M.R.I.A.
Natural History, . . .	George Dickie, M.D.
Logic and Metaphysics, .	Rev. James M'Cosh, LL.D.
Mineralogy and Geology, .	Wyville Thomson, LL.D., F.R.S.E., F.G.S.
Civil Engineering, . .	James Thomson, C.E., A.M.
Agriculture, ...	John F. Hodges, M.D., F.C.S.

Faculty of Medicine.

Anatomy and Physiology, .	Hugh Carlile, A.M., M.D., M.R.I.A.
Practice of Medicine, . .	John Creery Ferguson, A.M., M.B.
Practice of Surgery, . .	Alexander Gordon, M.D.
Materia Medica, . . .	James Seaton Reid, M.D.
Midwifery, ...	William Burden, M.D.

Faculty of Law.

English Law, . . .	Echlin Molyneux, A.M.
Jurisprudence and Polit. Econ.,	T. E. Cliffe Leslie, LL.B.

Office Bearers.

Curator of Museum, . .	The Professor of Mineralogy and Geology.
Registrar, ...	Rev. Richard Oulton, A.B.
Librarian, ...	Rev. George Hill.
Bursar, ...	Alexander Dickey, Esq.

Deans of Residences.

United Church of England and Ireland, . . .	Rev. Henry Murphy, A.M.
General Assembly of the Presbyterian Church in Ireland,	Rev. Henry Cooke, D.D., LL.D.
Irish Association of Non-Subscribing Presbyterians, .	Rev. John Porter.
Wesleyan Methodists, . .	Rev. Daniel Macafee.

The students of the College are either Matriculated or Non-matriculated. All the courses for Matriculated students in Arts, including the Departments of Civil Engineering and Agriculture, and also in the Faculties of Medicine and of Law, will be found in the Calendar which is published annually.

Non-matriculated students, on paying the regulated class fees, and signing an engagement to observe order and discipline in the College, are permitted, without undergoing a preliminary examination, to attend any separate course or courses of lectures; but are not permitted to become candidates for Scholarships or Prizes, or to enjoy other privileges of the Matriculated students.

Students in any of the Faculties can be admitted *ad eundem* from the other Queen's Colleges, or from any University capable of granting degrees.

Collegiate Scholarships.

In the Faculty of Arts—30 Junior Scholarships, of £24 each, are awarded to Undergraduates—15 for Proficiency in Literature, and 15 for Proficiency in Science; also, 7 Senior Scholarships, of £40 each, to Graduates; also, 2 Scholarships, of £20 each, to Engineering, and 4, of £15 each, to Agricultural Students.

In the Faculty of Medicine—6 Junior Scholarships, of £20 each, and 2 Senior Scholarships, of £40 each, are awarded.

In the Faculty of Law—3 Junior Scholarships, of £20 each, and 1 Senior Scholarship, of £40, are awarded.

Scholarships awarded in the Several Faculties,

1857–58.

10 Senior Scholarships awarded.
27 Junior Scholarships in Arts awarded.
2 Engineering Scholarships
3 Agricultural Scholarships.
6 Medical Scholarships.
3 Law Scholarships.
Lapsed—2 Literary Scholarships of second year's Arts.
,, 1 Science Scholarship of first year's Arts.
,, 1 Agricultural Scholarship of second year.

1858–59.

8 Senior Scholarships awarded.
25 Junior Scholarships in Arts awarded.
1 Engineering Scholarship.
3 Agricultural Scholarships.
6 Medical Scholarships.
2 Law Scholarships
Lapsed—1 Senior Scholarship.
,, 3 Literary Scholarships of Third Year.
,, 1 Science Scholarship of Third Year.
,, 1 Ditto. First Year.
,, 1 Engineering Scholarship of First Year.
,, 1 Agricultural Scholarship of Second Year.
,, 1 Law Scholarship of Second Year.

By an order of Her Majesty in Council, of 21st May, 1855, applying to the Civil Service, it is ordained that "every person nominated to a junior situation should obtain a certificate of qualification before entering on his duties." The ordinary classes in Queen's College embrace the branches required in this Examination for the Civil Service.

Special Courses have been arranged for students intending to become candidates for commissions in the Royal Artillery and Engineers, and for appointments to the Civil Service of India, both of which are now thrown open to public competition.

Queen's University in Ireland.

The charter founding the Queen's University in Ireland received the Royal sanction in the year 1850, and it provides that its Senate should have the power of conferring upon the students of the Queen's Colleges of Belfast, Cork, and Galway, such degrees and distinctions, in the Faculties of Arts, Law, and Physic, as are granted and conferred in other Colleges and Universities of Great Britain and Ireland. It further ordains that any of the students of the three Queen's Colleges, who shall have obtained such degrees in any of the several Faculties of Arts, Medicine, and Law, as shall be conferred by the Chancellor and Senate of the Queen's

APPENDIX, No. 1.

Queen's College, Belfast, and Queen's University.

University, shall be fully possessed of all such rights, privileges, and immunities, as belong to similar degrees granted by other Universities or Colleges, and shall be entitled to whatever rank and precedence is derived from similar degrees granted by other Universities.

By the charter of the Queen's University, candidates for Degrees in Medicine are required to have attended *at least one-third of the Courses of Medical Lectures* in some one of the Queen's Colleges. For the remainder of the Courses of Medical Lectures, authenticated certificates will be received from the Professors or Lecturers in Universities, Colleges, or Schools, recognised by the Senate of the Queen's University in Ireland.

The Chancellor and Senate also have the power of admitting, by special grace, Graduates of other Universities to similar and equal degrees.

In order to obtain a degree or diploma in the Queen's University it is necessary to enter the College as a Matriculated Student, to pass the entrance or Matriculation Examination, and to pursue a fixed course of study.

The Matriculated Students may be classified as follow :—

I.	Those intending to proceed to the		Degrees of A.B and A.M.
II.	,,	,,	Degree of M.D.
III.	,,	,,	Diploma of Elementary Law.
IV.	,,	,,	Degrees of LL.B. and LL.D.
V.	,,	,,	Diploma of Civil Engineering.
VI.	,,	,,	Diploma of Agriculture.

THE SENATE.

Chancellor.—The Right Honorable George William Frederick, Earl of Clarendon, K.G., G.C.B., &c.

Vice-Chancellor.—The Right Hon. Maziere Brady, M.R.I.A., &c.

His Grace Richard, Archbishop of Dublin, D.D., M.R.I.A., &c.

The Right Honorable William, Earl of Rosse, K.ST.P., M.R.I.A., &c.

The Right Honorable Thomas Spring, Baron Monteagle of Brandon, M.A., F.R.S., Member of Senate of University of London, Comptroller of the Exchequer.

The Right Honorable Francis Blackburne, Lord Justice in Appeal, LL.D., V.C.T.C.D., M.R.I.A.

The Right Honorable David R. Pigot, Lord Chief Baron of the Exchequer, M.R.I.A., &c.

The Right Honorable Sir Thomas Wyse, K.C.B.

The Rev. P. Shuldham Henry, D.D., President Queen's College, Belfast.

Sir Robert Kane, F.R.S., M.R.I.A., &c., President Queen's College, Cork.

Edward Berwick, Esq., President Queen's College, Galway.

Sir Richard Griffith, Bart., LL.D., M.R.I.A., Commissioner of Public Works.

Dominic J. Corrigan, M.D., M.R.I.A., Physician in Ordinary to the Queen in Ireland.

Colonel Thomas Askew Larcom, R.E., C.B., LL.D., F.R.S., M.R.I.A., &c.

James Gibson, Esq., A.M., M.R.I.A., Barrister-at-Law.

Robert Andrews, Esq., Q.C., LL.D.

The Right Honorable James Henry Monahan, Lord Chief Justice of the Common Pleas.

Robert Adams, A.M., M.D.

Secretary.—G. Johnstone Stoney, M.A.—Office, Dublin Castle.

The Senate holds its sitting in Dublin Castle, where the examinations of the students of the three Colleges, for Graduation and University Exhibitions, are annually conducted by Examiners appointed by the Senate from year to year.

APPENDIX, No. 2.

APPENDIX, No. 2.

Return of Students attending each Class.

RETURN of the NUMBER of STUDENTS attending each CLASS in the Queen's College, Belfast, in each Year.

CLASS.	SESSION.										
	1849-50.	'50-51.	'51-52.	'52-53.	'53-54.	'54-55.	'55-56.	'56-57.	'57-58.	'58-59.	'59-60.
Greek—1st year,	71	47	28	16	21	26	20	24	31	36	45
,, 2nd ,,	–	27	18	7	11	12	14	12	13	17	23
,, Higher,	–	–	–	–	–	–	–	–	–	5	4
Latin—1st year,	63	45	27	19	21	24	27	19	35	34	46
,, 2nd ,,	–	27	17	6	11	11	13	10	11	18	22
,, Higher,	–	–	–	–	–	–	–	–	–	2	3
The English Language,	52	46	28	20	21	28	31	21	36	41	49
History and English Literature, Senior ,, ,,	–	–	25	15	20	16	20	19	20	24	24
Modern Languages (French, German, Italian),	62	36	41	27	34	37	29	40	40	50	76
Senior ,,	–	20	28	16	15	15	19	12	16	13	17
The Celtic Languages,	*The Lectures in each*			*Session open*		*to the*	*Public*				
Mathematics—1st year,	86	58	40	25	29	33	30	35	39	45	61
,, 2nd ,,	–	12	11	11	13	11	15	17	16	14	13
,, Higher,	–	–	–	–	–	–	–	–	–	4	6
Natural Philosophy—Higher Class,	–	–	–	–	–	6	6	8	7	4	9
,, ,, with Demonstrations from Geometry, &c.	32	32	46	24	29	23	24	19	26	26	24
,, ,, Experimental,	48	59	57	20	40	34	36	37	41	28	42
,, ,, Practical Mechanics,	7	3	6	3	4	3	3	2	7	3	4
Chemistry,	37	53	63	44	51	60	50	70	60	74	81
Practical Chemistry,	6	7	14	10	15	14	12	10	11	14	21
Laboratory,	–	6	8	8	9	9	10	15	10	11	10
Zoology,	12	34	35	29	31	43	31	43	34	63	56
Botany,	12	49	46	35	37	46	36	44	34	62	55
Physical Geography,	–	–	29	17	21	19	20	21	28	23	28
Logic,	3	–	27	17	21	26	20	27	22	29	29
Metaphysics,	–	–	18	15	16	11	17	20	15	19	15
Higher Logic and Metaphysics,	–	–	6	7	7	8	6	7	9	8	–
Mineralogy and Geology,	*Public.*	6	14	13	15	13	9	20	13	11	16
Surveying,	10	9	9	6	6	9	4	15	7	7	12
Civil Engineering,	–	4	6	3	4	3	4	2	7	3	4
Theory of Agriculture,	11	8	7	2	6	5	5	4	7	7	7
Practice of Agriculture,	–	5	3	2	5	5	1	1	3	1	4
Diseases of Farm Animals,	–	5	3	2	5	5	1	1	4	2	3
Medical Jurisprudence,	2	8	14	10	13	8	10	15	16	13	17
Anatomy,	25	36	48	45	44	51	44	39	39	59	60
Practical Anatomy,	27	32	35	49	41	46	51	33	41	44	62
Practice of Medicine,	9	17	17	12	15	18	33	27	19	22	29
Practice of Surgery,	24	15	26	29	28	30	48	32	30	29	39
Materia Medica,	11	14	16	17	17	23	25	11	18	22	27
Midwifery,	14	10	12	18	17	18	24	13	7	17	14
Law of Property, Equity of Bankruptcy, Common and Criminal Law, Evidence and Pleading,	17	16	17	15	11	5	10	14	12	13	16
Jurisprudence and Political Economy, Arts,	–	–	12	2	9	8	6	2	18	9	7
Civil Law, Constitutional, Colonial, and International Law, Jurisprudence,	11	11	13	8	10	5	9	10	10	11	17
Arabic,	–	–	–	–	–	–	–	–	–	–	1
Hindustani,	–	–	–	–	–	–	–	–	–	–	2
Sanskrit,	–	–	–	–	–	–	–	–	–	–	6

APPENDIX, No. 8.

RETURN of the AMOUNT of FEES received by each Professor in the Queen's College, Belfast, in each Year.

		1849-50	1850-51	1851-52	1852-53	1853-54	1854-55	1855-56	1856-57	1857-58	1858-59	REMARKS.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
Professor Ringwood,	Greek,	88 10 0	—	—	—	—	—	—	—	—	—	In the Session 1849-50 Medical Students were required to attend the Greek and Latin Classes, but have since been exempt from attending either class.
" MacDouall,	Latin,	78 15 5	36 0 0	36 0 0	27 0 0	38 5 0	46 0 0	54 15 0	44 15 0	61 0 0	78 0 0	
" Reichel,		—	72 0 0	36 10 0	31 5 0	36 0 0	44 5 0	47 15 0	59 15 0	36 0 0	67 5 0	
" Craik,	English History and Literature,	50 5 0	50 5 0	47 10 0	31 5 0	43 5 0	45 5 0	59 5 0	43 10 0	67 10 0	69 0 0	
" Blakey,	Logic and Metaphysics,	5 0 0	—									
" Dr. M'Cosh,	"	—	—	*59 5 0	64 5 0	87 15 0	41 0 0	41 10 0	48 5 0	48 15 0	55 10 0	* Dr M'Cosh was appointed in Session 1851-52, and taught and received fees from Students properly belonging to the previous Session.
" Wilson,	Mathematics,	118 15 0	97 10 0	60 10 0	43 0 0	64 10 0	—	—	—	—	—	
" Tait,		—	—	—	—	—	58 0 0	60 10 0	62 15 0	69 10 0	97 10 0	
" Dr Stevelly,	Natural Philosophy,	70 5 0	70 15 0	93 10 0	47 0 0	73 10 0	78 15 0	80 10 0	62 15 0	72 0 0	69 13 0	
" Dr Andrews,	Chemistry,	72 5 0	64 0 0	98 5 0	71 10 0	84 10 0	105 15 0	93 10 0	116 0 0	80 0 0	125 5 0	
"	Practical Chemistry,	33 0 0	16 5 0	19 0 0	20 0 0	27 0 0	26 0 0	22 0 0	17 0 0	65 10 0	32 0 0	
" Dr Carlile,	Anatomy and Physiology,	32 10 0	80 0 0	105 15 0	106 5 0	105 0 0	121 5 0	164 10 0	95 15 0	69 0 0	162 10 0	The Professor of Anatomy pays annually to the Demonstrator a certain proportion of the fees for Practical Anatomy, which amounted to £30 in each of the Sessions 1849-50, 1850-51, 1851-52, £64 10s. in 1852-53, £60 in 1854-55, and £60 in 1855-56.
"	Practical Anatomy,	36 10 0	36 5 0	20 0 0	124 10 0	125 0 0	120 0 0	139 10 0	94 10 0	117 5 0	120 0 0	
" Dr Dickie,	Natural History and Botany,	26 10 0	89 0 0	70 15 0	50 15 0	35 0 0	70 15 0	88 10 0	50 0 0	52 10 0	105 5 0	
" Dr Frings,	Modern Languages,	37 0 0	64 0 0	63 0 0	60 0 0	61 0 0	85 0 0	74 0 0	60 0 0	26 0 0	120 0 0	
" M'Coy,	Mineralogy and Geology,	—	7 10 0	34 15 0	17 15 0	20 15 0	—	—				
" Dr W Thomson,	"	—	—	—	—	—	19 0 0	12 13 0	37 0 0	40 0 0	21 13 0	
" Dr Hancock,	Jurisprudence and Political Economy,	20 0 0	21 0 0	35 10 0	18 15 0	—	—	—	—	—	—	
" Leslie,		—	—	—	—	28 0 0	14 10 0	29 5 0	82 10 0	61 15 0	38 10 0	
" Molyneux,	English Law,	31 0 0	20 0 0	37 0 0	23 0 0	40 0 0	10 0 0	61 0 0	37 0 0	21 0 0	25 0 0	
" Godwin,	Civil Engineering,	10 0 0	24 10 0	20 0 0	14 0 0	17 16 0	21 0 0	10 10 0	37 0 0	7 0 0	—	
" Thomson,		—	—	—	—	—	—	—	—	14 13 4	22 10 0	
" Dr Hodges,	Agriculture and Medical Jurisprudence,	15 10 0	41 0 0	43 0 0	33 0 0	46 0 0	34 15 0	30 0 0	23 10 0	40 5 0	31 5 0	No endowment for Medical Jurisprudence. Dr Hodges delivers the lectures, receiving only class fees.
" Dr Ferguson,	Practice of Medicine,	17 0 0	34 0 0	32 0 0	18 0 0	26 0 0	30 0 0	36 0 0	43 13 0	29 0 0	37 0 0	
" Dr Gordon,	Surgery,	41 0 0	61 10 0	36 0 0	61 0 0	62 0 0	45 0 0	74 0 0	41 10 0	34 0 0	40 5 0	
" Dr Stewart,	Materia Medica,	23 0 0	28 0 0	26 0 0	20 0 0	33 0 0	43 0 0	45 0 0	20 0 0	—	—	
" Dr Reid,	"	—	—	—	—	—	—	—	—	34 0 0	30 0 0	
" Dr Burden,	Midwifery,	28 5 0	10 0 0	22 5 0	27 0 0	81 0 0	38 0 0	44 0 0	84 0 0	19 0 0	28 0 0	
Mr Robert Hale,	Teacher of Drawing,	—	—	—	—	—	—	—	30 0 0	25 0 0	26 0 0	

Queen's College, January, 1859.

ALEXANDER DICKEY, *Bursar.*

APPENDIX, No. 8.
Fees received by Professors.

APPENDIX, No. 4.

Lectures delivered by Professors.

APPENDIX, No. 4.

RETURN of the NUMBER of LECTURES delivered by each Professor in the Queen's College, Belfast, in each YEAR.

	1849-50.	'50-51.	'51-52.	'52-53	'53-54	'54-55.	'55-56	'56-57.	'57-58	'58-59	REMARKS.
Professor of— Greek,	135	232	244	246	236	240	234	233	236	240	In addition, examining about 300 exercises each session.
Latin,	162	197	216	221	189	196	232	230	230	275	Do. do.
History and English Literature,	35	55	98	91	104	100	105	105	99	110	
Modern Languages,	208	330	324	307	306	305	319	340	369	307	
Celtic,	6	6	6	6	6	6	6	6	6	6	Open to the Public without charge.
Mathematics,	135	236	333	248	246	320	346	322	330	400	Besides two hours each week on which the Senior Scholar meets the Junior Division.
Natural Philosophy,	122	257	233	209	256	250	235	307	300	309	
Chemistry,	134	136	137	129	132	130	138	142	142	140	In addition, eight working pupils admitted each year by examination to the laboratory without charge.
Practical Chemistry,	36	36	36	36	36	36	36	36	34	36	
Natural History,	120	120	133	137	139	138	142	140	143	140	Including lectures in Physical Geography, delivered free to all students (among whom are Engineering Students, who never pay this Professor any fee).
Logic and Metaphysics,	–	–	78	142	176	175	164	177	179	167	In addition, criticising above 250 Essays in each session.
Mineralogy and Geology,	*Public.*	86	54	59	54	55	49	59	52	52	In addition, daily attendance as Curator in the Museum.
Civil Engineering,	134	138	140	136	140	136	147	118	109	194	Including practical work under the direction of the Professor.
Agriculture,	172	206	205	212	209	213	218	186	190	166	Including lectures on Medical Jurisprudence and Diseases of Farm Animals, for neither of which there is any salary; in addition, practical excursions with students.
Anatomy and Physiology,	115	116	115	115	114	113	117	113	115	115	In addition, superintending the class of Practical Anatomy and Demonstrations and Dissections
Practice of Medicine,	93	93	92	92	93	94	94	85	75	95	
Practice of Surgery,	93	94	93	91	91	92	94	94	94	94	Besides about five lectures each session on Operative Surgery.
Materia Medica,	92	91	91	93	90	90	92	80	84	84	
Midwifery,	92	92	92	91	90	93	93	93	93	95	Besides practical instruction to students which may be required at any hour throughout the year.
English Law,	24	48	72	96	96	96	96	96	96	96	
Jurisprudence and Political Economy,	24	48	96	120	120	120	120	120	120	96	

The above Return gives the number of Meetings of one hour each, in each Class. The system of instruction includes, not merely formal Lectures, but also examination in the business of the course; in some classes these examinations are held daily; in others on fixed days of the week, according to the nature of the subject.

The Professors also conduct the General Scholarship Examinations, and some of them, in addition, the Matriculation and Supplemental Examinations

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APPENDIX, No. 5.

Expenditure of One Year's Additional Grant.

APPENDIX, No. 5.

ACCOUNT of the EXPENDITURE of ONE YEAR'S ADDITIONAL GRANT of £1,600, to the Queen's College, Belfast, ending 31st March, 1859.

1. Library of Ancient and Modern Literature and Philology:

	£	s.	d.
Ancient Classical Languages and Philology,	69	13	5
English History and Literature,	29	11	8
Foreign Modern Languages,	42	7	0
Works of General Interest, &c.,	200	6	4
	341	18	5

2. Libraries, Museum, &c., Mathematical, Physical, and Chemical Sciences:

	£	s.	d.
Mathematical Library,	36	9	9
Physical Library,	17	3	10
Chemical Library,	8	9	7
Museum and Cabinet of Physical Science,	45	3	3
,, Laboratory, Chemical Science,	67	1	0
	174	7	5

ACCOUNT of the EXPENDITURE of ONE YEAR'S ADDITIONAL GRANT of £1,600, to the Queen's College, Belfast, ending 31st March, 1859—*continued.*

APPENDIX, No. 5.

Expenditure of One Year's Additional Grant.

	£	s.	d.
3. Libraries, Museum, and Collection of Objects of the Department of the Natural Sciences:			
Library of Natural History,	35	3	2
,, Geology and Mineralogy,	32	11	7
Museum of Natural History,	29	16	4
,, Geology and Mineralogy,	39	2	7
,, Materia Medica,	22	2	2
,, Arts,	28	12	3
	187	8	1
4. Libraries, Museums, and Collections of Objects of the Departments of Engineering and Agriculture:			
Library of Engineering,	23	1	7
,, Agriculture,	22	13	7
Instruments and Collections of Engineering,	33	9	9
Collections of Agriculture,	11	8	7
	90	13	6
5. Museum and Library of Medical Science:			
Library of Medical Works,	78	6	0
Anatomical and Pathological Museums, and Rent of Anatomical Rooms,	84	8	4
Surgical Museum,	20	2	6
Medical Jurisprudence,	16	0	6
	198	17	4
6. Library of Metaphysical, Legal, and Economical Science:			
Law, Jurisprudence, and Political Economy,	37	14	3
Metaphysics,	35	12	6
	73	6	9
7. Printing, Stationery, Advertising, Postages, Office Expenses, &c.,	262	4	4
8. Heating and Lighting,	113	15	5
9. Botanic Gardens, £50; Grounds, £55 5s. 9*d.*,	105	5	9
	1,547	17	0
Balance in Bank of Ireland Office, 31st March, 1859,	230	7	10
Total,	1,778	4	10

	£	s.	d.
Amount of One Year's additional Grant,	1,600	0	0
College and Matriculation Fees,	68	5	0
Balance in Bank, 31st March, 1858,	100	6	4
Received for Calendars, Catalogues, &c. sold, and Fines,	9	13	8
Total,	1,778	4	10

The Accounts of the College up to 31st March, 1859, have been examined and found correct, by the Commissioners for Auditing the Public Accounts.

January, 1860. ALEXANDER DICKEY, *Bursar.*

APPENDIX, No. 6.

APPENDIX, No. 6.

General Class Examinations.

GENERAL CLASS EXAMINATIONS, Queen's College, Belfast.

	Session 1858–59.			Session 1859–60.			A.M.	P.M.
The English Language,	Saturday,	January	8	Saturday,	January	7	—	12—4
Physical Geography,	Thursday,	January	13	Saturday,	January	14	9—12	—
Logic,	Saturday,	February	12	Saturday,	February	11	9—12	—
Zoology,	Friday,	March	11	Saturday,	March	10	9—12	—
Mineralogy and Geology,	Wednesday,	April	20	Wednesday,	April	4	—	2—5
Metaphysics,	Tuesday,	April	19	Tuesday,	April	3	9—12	and 2—5
History and English Literature,	Thursday,	April	21	Thursday,	April	5	9—12	,, 2—5
Midwifery,	Tuesday,	April	26	Thursday,	April	26	9—12	—
Practice of Medicine,	Tuesday,	April	26	Thursday,	April	26	—	2—5
Anatomy and Physiology,	Wednesday,	April	27	Friday,	April	27	9—12	and 2—5
Practical Anatomy,	Thursday,	April	28	Saturday,	April	28	9—12	—
Practice of Surgery,	Thursday,	April	28	Saturday,	April	28	—	2—5
Materia Medica,	Friday,	April	29	Monday,	April	30	9—12	—
Medical Jurisprudence,	Friday,	April	29	Monday,	April	30	—	2—5
Practical Chemistry,	Thursday,	April	21	Saturday,	April	14	9—12	—
Greek (First Year),	Friday,	June	3	Thursday,	May	31	9—12	and 2—5
,, (Second Year),	Saturday,	June	4	Friday,	June	1	9—12	,, 2—5
Latin (First Year),	Saturday,	June	4	Friday,	June	1	9—12	,, 2—5
,, (Second Year),	Friday,	June	3	Thursday,	May	31	9—12	,, 2—5
Natural Philosophy,	Saturday,	June	4	Friday,	June	1	9—12	,, 2—5
Surveying,	Saturday,	June	4	Friday,	June	1	9—12	—
Mathematics (First Year),	Monday,	June	6	Saturday,	June	2	9—12	and 2—5
,, (Second Year),	Monday,	June	6	Saturday,	June	2	9—12	,, 2—5
,, ,,	Tuesday,	June	7	Monday,	June	4	9—12	—
Modern Languages,	Tuesday,	June	7	Monday,	June	4	9—12	and 2—5
Chemistry,	Wednesday,	June	8	Tuesday,	June	8	9—12	,, 2—5
Botany,	Thursday,	June	9	Wednesday,	June	6	9—12	—
Civil Engineering,	Thursday,	June	9	Wednesday,	June	6	9—12	—
Practice of Agriculture,	Thursday,	June	9	Wednesday,	June	6	9—12	—
Diseases of Farm Animals,	Thursday,	June	9	Wednesday,	June	6	9—12	—
Theory of Agriculture,	Thursday,	June	9	Wednesday,	June	6	—	2—5

General Examination of Students in Law, and also of Students in the Faculty of Arts, in Jurisprudence, and Political Economy, at the close of the Lectures on these subjects.

[OCTOBER EXAMINATIONS.

October Examinations of Queen's College, Belfast, 1859.

Days.	Hours.	First Year Students.	Second Year Students.	Third Year Students.	Fourth Year Students.
Tuesday, Oct. 18.	9—12		Suppl. Ex. { English. Mod. Lang. Math.	Suppl. Ex.—Chem., Math.	Senior Schol.—Latin.
	2—5		Suppl. Ex.—Greek—Latin.	Suppl. Ex.—Greek, Latin, Nat. Hist., Logic	Senior Schol.—Latin.
Wednesday, Oct. 19.	9—12			Sci. Schol.—Logic.	Senior Schol.—Greek.
	2—5		Liter. Schol.—Greek.	Sci. Schol.—Metaph.	Senior Schol.—Greek.
Thursday, Oct. 20.	9—12		Liter. Schol.—Greek. Med. Engin. Agric. } Schol.—Chem.	Sci. Schol.—Chem.	Senior Schol.—Math.
	2—5	Matric.—Math.	Med. Engin. Agric. } Schol.—Chem.	Sci. Schol.—Chem.	Senior Schol.—Math.
Friday, Oct. 21.	9—12	Matric.—Greek, Latin.	Liter. Medic. } Schol.—Mod. Lang.		Senior Schol.—Mod. Lang.
	2—5		Liter. Medic. } Schol.—Mod. Lang.		Senior Schol.—Mod. Lang.
Saturday, Oct. 22.	9—12	Matric.—English.	Liter. Schol.—Latin. Engin. Schol.—Surveying.	Sci. Schol.—Math.	Senior Schol.—Mod. Hist.
	2—5	Matric.—English.	Liter. Schol.—Latin. Engin. Schol.—Surveying.	Sci. Schol.—Math.	Senior Schol.—Mod. Hist.
Monday, Oct. 24.	9—12		Engin. Schol.—Min. and Geo. Med. Schol. Agric. Schol. } Botany.	Sci. Schol.—Bot.	Senior Schol.—Nat. Hist.
	2—5	Lists of Matriculated Students to be made out.	Liter. Schol.—English Agric. Schol.—Zool.	Sci. Med. } Schol.—Zool.	Senior Schol.—Nat. Hist.
Tuesday, Oct. 25.	9—12	Science Med. Engin. } Schol.—Math. Agric. Schol.—Arith.	Science Engin. } Schol.—Math.		Senior Schol.—Chemis.
	2—5	Science Med. Engin. } Schol.—Math.	Scinnce Engin. } Schol.—Math. Med. Schol.—Anat. and Phy.	Sci. Schol.—Nat. Phil. Liter. Schol.—Latin. Med. Schol.—Anat. and Phy.	Senior Schol.—Chemis. Med. Schol.—Pr. of Midw.
Wednesday, Oct. 26.	9—12		Agric. Schol.—Agriculture.	Liter. Schol.—Mod. Lang. Med. Schol.—Prac. Chem.	Senior Schol.—Nat. Phil. Med. Schol.—Pr. of Med.
	2—5	Liter. Med. Agric. } Schol.—English.		Liter. Schol.—Mod. Lang. Med. Schol.—Physics.	Senior Schol.—Nat. Phil.
Thursday, Oct. 27.	9—12	Liter. Med. } Schol.—Greek.		Liter. Schol.—Greek. Med. Schol.—Mat. Med.	Senior Schol.—Pol. Econ. Med. Schol.—Med. Juris.
	2—5	Liter. Med. } Schol.—Latin.		Liter. Schol.—Latin.	Senior Schol.—Pol. Econ. Med. Schol.—Surg. Anat.
Friday, Oct. 28.	9—12	Liter. Med. } Schol.—Latin.			Senior Schol.—Metaph. Med. Schol.—Anatomy.
	2—5	Liter. Med. } Schol.—Greek.		Liter. Schol.—Greek.	Senior Schol.—Metaph. Med. Schol.—Physiology.

Students passing the Supplementary Examinations complete the previous year, and take rank accordingly.

APPENDIX, No. 6.

Hours of Lectures.

Hours of Lectures, Queen's College, Belfast,—Session 1859–60.

Hours.	Arts.			Civil Engineering.		Agriculture.		Medicine and Law.
	1st Year.	2nd Year.	3rd Year.	1st Year.	2nd Year.	1st Year.	2nd Year.	
9 till 10	*French.* Monday Wednesday Thursday *German.* Tuesday. Friday	*Mathematics.* Monday Tuesday Wednesday Thursday Friday	*Ph. Geog.* Saturday		*Mathematics.* Monday Tuesday Wednesday Thursday Friday			
10 till 11	*Mathematics.* Monday Tuesday Wednesday Thursday Friday		*Metaphysics.* Tuesday Wednesday Thursday Friday *Ph. Geog* Monday	*Mathematics.* Monday Tuesday Wednesday Thursday Friday	*Civil Eng.* Tuesday Thursday Saturday		*Pr. of Agri. & Dis. F. Anim.* Tuesday Thursday	*Evidence and Pleading.* Tuesday Thursday Saturday
11 till 12	*Latin.* Monday Tuesday Wednesday Thursday	*Greek.* Monday Thursday Friday	*Nat. Philos.* Monday Wednesday Friday	*Min. & Geog.* Monday Wednesday Friday *ure &Co.Eng.* Tuesday Thursday Saturday.	*Nat. Philos* Monday Wednesday Friday	*Theo. of Agri.* Tuesday Thursday	*Min. & Geog.* Monday Wednesday Friday *Survey.* Tuesday Thursday Saturday	*Com. & Crim. Law.* Tuesday Thursday Saturday *Prac. Chem.* Monday Tuesday Friday 10-30 till 11-30
12 till 1	*Greek.* Tuesday Thursday Friday Saturday	*Latin.* Monday Tuesday Wednesday Thursday	*History.* Monday Wednesday Friday					*Mat. Med.* Saturday *Practical Anatomy.* Monday Tuesday Wednesday Thursday Friday 11-4 till 12-
1 till 2	*English.* Monday Tuesday Wednesday Friday	*Zool. and Bot.* Tuesday Wednesday Thursday Friday	*Ex. Phys.* Monday Wednesday Friday		*Ex. Phys.* Monday Wednesday Friday	*Zool. and Bot.* Tuesday Wednesday Thursday Friday	*Ex. Physics.* Monday Wednesday Friday	*Zoology and Botany.* Tuesday Wednesday Thursday Friday
2 till 3		*Logic.* Tuesday Wednesday Thursday Friday	*Pol. Econ.* Tuesday Thursday Friday		*Pr. Mech.* Tuesday Thursday			*Anatomy and Physiology* Monday Tuesday Wednesday Thursday Friday
3 till 4		*Chemistry.* Monday Tuesday Wednesday Thursday Friday (vol.)		*Chemistry.* Monday Tuesday Wednesday Thursday Friday		*Chemistry.* Monday Tuesday Wednesday Thursday Friday		*Midwifery.* Monday Tuesday Thursday Friday *Chemistry.* Monday Tuesday Wednesday Thursday Friday *Med. Juris.* Wednesday Saturday
4 till 5		Chemical Laboratory, open from 8 A.M. till 3 P.M.		Drawing, on Tuesdays, Thursdays, and Saturdays, from 11 A.M. till 2-30 P.M.				*French.* Monday Thursday *Pr. of Med.* Monday Tuesday Wednesday Thursday *Mat. Med.* Friday *Equity & Bank.* Monday Wednesday Friday
5 till 6								*Surgery* Wednesday Thursday Friday Saturday *Materia Medica.* Monday Tuesday
6 till 7								*Law of Prop.* Monday Wednesday Friday *Civil Law.* Monday Wednesday Friday
7½ till 8½			*Jurisprud.* Monday Wednesday Friday					*Jurisprudence.* Monday Wednesday Friday
8½ till 9½								*Cons. & Col. Law.* Monday Wednesday Friday

APPENDIX, No. 7.

APPENDIX, No. 7.

Digest of Subjects and Courses.

An Enlarged Digest of Subjects and Courses pursued in Queen's College, Belfast.

Greek.

Professor, Charles MacDouall, LL.D., M.R.A.S.

In the Greek Class, as in all those which are attended during more than one session, the business, as well as the hours assigned to the Students of the different years, is necessarily different; but it is always distributed into three simultaneous processes, viz., public examinations, lectures more or less formal, and exercises written at home and commented on in the class.

In the first session, the complex and self-contained structure of the Greek Language is subjected to a close analysis; carried out, on the one hand, by tracing words to their crude forms, by classifying terminations, both the primary and the flexional, and by discriminating among analogically correct forms those actually used in different ages and dialects; on the other hand, by exhibiting the methods by which words are combined in simple clauses, clauses are knit into sentences, and sentences compose periods less or more complicated. Some prose-work furnishes the materials for this analysis; while the Students read and translate it, or else re-translate off-hand passages read out in English before them by the Professor. Besides syntactical phænomena, the laws and characteristics of both epic and dramatic versification are expounded and exemplified, while a portion of the *Ilias* and some tragedy are used as text-books.

In the second session, while consecutive passages of Herodotus along with some Attic oration or philosophical treatise, and a book of the *Odysseia* along with some Attic tragedy or comedy, form the basis of prelections, the previous discipline is continued and extended; the distinctions of dialect and style are more fully elucidated; the origin, growth, and fortunes of the epos, the drama, history, and other departments of literature, are more distinctly unfolded; discussions on points of mythology, geography, chronology, archæology, æsthetics, &c., are more freely introduced and more amply treated. The Students are required to turn Herodotean Greek, at sight, into Attic, altering both the forms of words and the structure of sentences; to

APPENDIX, No 7.

Digest of Subjects and Courses.

re-translate passages into Greek prose and verse; and also to give in original essays in both forms of composition.

Considering the variety of subjects which enter simultaneously into the first and second Sessions of the Collegiate Course, the Students generally appear to give a fair share of their attention to the Greek Language and Literature. Several times in the week a considerable number voluntarily attend extra Lectures, at which no note is taken of their presence or of their absence.

In a distinct or higher Class, advanced Students, generally in the third or fourth year of their Course, are exercised in the study of more difficult works than those previously read, in the higher problems of criticism and philology, and especially in composing both prose and verse.

SANSKRIT AND HINDUSTANI.

Classes for these Languages have been this year opened by the Professor of Greek, and are well attended by Students who either have already obtained or are preparing to compete for Civil Appointments in the Indian Service.

LATIN.

Professor, Charles Parsons Reichel, D.D.

The course read in the Latin Classes, during the Sessions 1854–55, 1855–56, 1856–57, 1857–58, 1858–59, is as follows:—

Session 1854–55.

Senior Class.—Cicero Actiones Verrinæ, Cicero de Finibus, Cicero de Oratore, Lucretius.

Junior Class.—Tacitus' Agricola, Tacitus' Histories; Juvenal; Cicero, Tusculan Questions; Horace, Epistles.

Session 1855–56.

Senior Class.—Tacitus' Annals; Cicero de Finibus; Horace, Epistles.

Junior Class—Tacitus' Agricola, Tacitus' Histories; Cicero pro Caecina, Cicero Tusculan Questions; Juvenal.

Session 1856–57.

Senior Class.—Tacitus' Annals; Plautus' Captivi; Horace, Epistles; Lucretius, B. II.

Junior Class.—Cicero de Natura Deorum; Cicero de Finibus; Juvenal.

Session 1857–58.

Senior Class.—Cicero Actiones Verrinæ; Lucretius, B. 3; Horace, Epistles.

Junior Class.—Agricola; Livy, B. 22; Virgil, Georgics.

Session 1858–59.

Senior Class.—Cicero Epistolae ad Atticum; Lucretius; Tacitus.

Junior Class.—Cicero in Catilinam; Cicero in Verrem; Tacitus, Germania.

The Junior Class is that composed of Students of the *First Year;* the Senior that composed of Students of the *Second Year.*

The Professor, therefore, has each set of Students only two years, at most, under his care, no attendance on Lectures in Latin or Greek being required of Students in their Third Year.

The Professor requires the Class to prepare for each Lecture a certain portion of the authors in course of being read. The Professor sometimes translates to the Class, sometimes requires them to translate aloud, making such corrections and observations as may be necessary fully to explain the passage, and to throw light on the idiom of the author, and the structure and analogy of the language.

Besides this, full statements of the historical and legal points involved in the authors read, are furnished by him.

Exercises in Latin Prose Composition are also given by him from time to time.

An advanced Latin Class has been formed during the last three Sessions, attended by Students of the third or fourth year, who may wish to carry on the study of the Latin language beyond the point at which the prescribed course leaves them. This Class cannot be numerously attended, as the time of Students of the third year is so much taken up with their prescribed courses in other branches—those who attend it have to do so under the greatest difficulty; and probably nothing but the impossibility of successfully competing with Students from other Universities, without a greater knowledge of Latin than the regular College course will enable them to acquire, has induced any Students to attend it.

The Professor is happy in adding that the deficiencies in the Classical Departments of the Library and Museum are being remedied.

ARABIC.

The Professor of Latin has this Session begun an Arabic Class; and hopes that the attention of many Students may in time be attracted to this important language, which occupies in the East much the same position as French does in Europe.

HISTORY AND ENGLISH LITERATURE.

Professor, George Lillie Craik, A.M.

The Professor of History and English Literature has two Classes: one entitled the Class of the English Language, which is taught for one term, and is attended, according to the Curriculum for Degrees in Arts, by Students of the First Year; the other entitled the Class of History and of English Literature, which is taught for two terms, and is attended by Students of the Third Year.

It is important to observe, that by this arrangement there is added, to the two distinct subjects which are combined in the designation of the chair, a third subject perfectly distinct from either; each of the three, at the same time, like every other great department of human knowledge and speculation, having several subdivisions.

I. The Class of the English Language is taught by means of—

1. A Course of Lectures on the origin, history, and constitution of the language, and on the principles of Universal Grammar.
2. Examinations on a printed textbook, prepared by the Professor, entitled, "Outlines of the History of the English Language."
3. Exercises in Composition, both in prose and verse; and
4. A Course of Critical Readings, directed more especially to the philology of the language, both in its principles and in its details.

The business of the Class, thus conducted, may be stated to comprehend the subjects of Universal Grammar, or the Philosophy of Language generally, with the Elements of Comparative Grammar and of Linguistic Ethnology, the Philology of the English Language, and the Practice of English Composition.

For the completion of the Course, it has been found necessary to have voluntary meetings once a-week throughout the second term, which have been hitherto attended, with few exceptions, by the whole Class.

II. In the Class of History and of English Literature, the teaching of History has hitherto embraced the Outlines of Historical Geography; the Elements of Chronology; a sketch of the General History of the World; a Course of Lectures on the Science of Historical Investigation; and a minute survey, by way of illustration, of various portions of the history of England, including the progress of the constitution and of society, as well as the course of public events and transactions, with special reference to the original authorities, and to the bibliography of the subject. No text-book has been used, but examinations are regularly held, the Students being left to collect the facts necessary to be remembered from the Lectures, and from any of the common histories.

The subject of English Literature is treated both historically, and in reference to the principles of æsthetic and critical science. For the history of our literature, a work of the Professor's, entitled "Sketches of the

APPENDIX,
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Digest of Subjects and Courses.

History of Literature and Learning in England," is employed as a text-book; and a Course of Lectures is delivered on the subject of Literature as one of the forms of the Artistic. There are regular examinations both on the text-book and on the Lectures; and essays, or other exercises in writing, are exacted throughout this part of the Course. In the present Session of 1859–60 the Professor has also opened a class for superintending and directing the reading of students preparing for the public examinations, which meets once a week throughout the First and Second Terms.

MODERN LANGUAGES.

Professor, Mathias Joseph Frings, PH.D.

The foreign Modern Languages taught up to the present day are French, German, and Italian. The Students generally select the former for their College Course; one-fourth of the Class, on an average, however, take up both languages; few take German alone.

The mechanism and peculiarities of the respective languages are carefully illustrated by the Professor, who is unremittingly endeavouring to enable the Students to think in that language which they are pursuing. To effect this, the Students are made to translate more frequently from their mother tongue into the one to be acquired than *vice versâ*, and orally return, without delay, in French or German, any sentence that may be proposed in English.

The Professor also occasionally delivers a Lecture on the History of French or German Literature, or Language. On all these topics the Students are frequently examined.

The books recommended are, plays from Göthe, Schiller, Wieland; from Corneille, Racine, and Molière; Dante, Goldoni, Manzoni; also historical writings in both languages. Some one of these books is critically read aloud once a week, by the Students, and turned by them into English.

The result of these proceedings, considering the very short time allowed, has generally proved satisfactory. At the end of the Session the Students who, almost all, began, as it were, with A, B, C, were able to translate tolerably well an easy French, Italian, or German author, and also generally made a good attempt at turning the English into the Modern Language. They were also pretty well acquainted with the leading features of the history of that language which they have been pursuing, and satisfactorily answered the principal questions of its grammar.

The Students attending to the Modern Languages during one Session only, and beginning, so to say, at the very foot of the hill, have, unfortunately, no time left to enter the field for Comparative Grammar.

Also, three Courses for Senior Students who are required to attend a more extended course for the Degree of A.M., are delivered in German, French, and Italian.

There is an Evening Course for Medical Students who are not able to attend the Course for the Students of Arts.

CELTIC LANGUAGES.

Professor, John O'Donovan, M.R.I.A.

The Professor delivers a series of Lectures in each Session on the Irish Language. These Lectures are open to the Public.

MATHEMATICS.

Professor, Peter Guthrie Tait, M.A., F.C.P.S.

Attendance on this Class is prescribed to all Students in the Faculty of Arts during the first year of their Course; during the second year they are required to attend either a higher Course of Mathematics, or of Latin and Greek.

All Students in the Department of Engineering are required to attend the Mathematical Classes during two years.

Before entering, Students are required to pass an examination in the First and Second Books of Euclid, and in a small portion of Algebra. Practically they are generally well prepared in the prescribed portions of Euclid, while, on the contrary, it has been necessary, with a large portion of the Class, to commence the instruction in Algebra from the very beginning. A considerable number of the Students are Candidates for Mathematical Scholarships at entrance, and these are generally well prepared in the first six Books of Euclid, and a considerable portion of Algebra and Plane Trigonometry.

On this account the instruction of the First Year in Mathematics has been given in two Divisions. The Lower Division has been carefully taken through such portions of Euclid, I., II., III., IV., VI., as they had not previously prepared, and has received instructions in Algebra as far as the progressions, and in Plane Trigonometry as far as the solution of triangles, with the use of logarithms and trigonometrical tables. The instruction of the Upper Division comprises a complete Course of Algebra and Trigonometry, with the principal historical properties of the Conic Sections, treated geometrically.

The Council has sanctioned the employment of the Senior Mathematical Scholar in giving a portion of the instruction of the Lower Division. This arrangement, while it affords a greater number of hours to the Lower Division, enables the Professor of Mathematics to give more attention to the Upper Division, and has been found to work very satisfactorily.

In the Second Year the subjects of Lecture are Analytical Geometry, the Differential and Integral Calculus, and the first three Sections of the Principia of Newton; and, in addition to this, when the progress of the Students has been sufficiently rapid during the early part of the Session, the solution of the simpler kinds of Differential Equations, and the principles of Analytical Geometry of Three Dimensions. Spherical Trigonometry and the Theory of Equations are not included in the subjects of Lecture, but are required from the Candidates for Science Scholarships of the Third Year.

The instruction is carried on in great part by questions, which the Students are required to work out at the time, under the eye of the Professor, the questions having reference to those portions of the subject which have just been treated in the Lectures. The Professor then corrects their work, and gives such hints and explanations as are requisite.

During the last two Sessions, at the request of a few advanced Students, a third and higher class has been formed. The subjects of lecture have been Geometry of three dimensions, Finite Differences, Calculus of Functions, Calculus of Variations, and extended courses of Definite Integrals, Differential Equations, and Theory of Probabilities.

THE PHYSICAL CLASSES.

Professor, John Stevelly, LL.D.

The subjects taught in the Physical Classes are distributed under three subdivisions: Natural Philosophy, Experimental Physics, and Practical Mechanics.

The subjects comprised in the Course of Natural Philosophy are—Mechanics (under its several statical and dynamical subdivisions), Hydrostatics, Hydraulics, Pneumatics, Acoustics, Optics, and Astronomy. The Students who attend this class are the Matriculated Students who are seeking a Degree in Arts, the Engineering Students of the Second Year, and Non-Matriculated Students, some of whom are Candidates for the ministry in the Presbyterian Churches. Attendance at the Lectures three days in each week is imperative on all those Students, and one hour in each week is occasionally employed in asking questions from prescribed parts of Galbraith and Haughton's Manual. Two days in the week attendance is optional, when Analytical Mechanics and the higher branches of Physics are taught. In the Lectures, attendance on which is imperative, such mathematical proofs and illustrations only are introduced as a person reasonably prepared in the six first books of Euclid and Elementary Algebra might easily comprehend. The teaching is by prælection, and although no text-books are prescribed, the ordinary elementary works on the several subjects are pointed out and referred to. At the Lectures, attendance on

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Digest of Subjects and Courses.

which is voluntary, the demonstrations and investigations are pursued in a more systematic and mathematical method, so as to require a knowledge of Analytic Geometry, Conic Sections, and the Differential and Integral Calculus. Text books are used for the guidance of the Students attending these Lectures, who are chiefly those who are intending to compete for Honors. These text-books are Earnshaw's and Todhunter's Statics, Wilson's Dynamics, Tait's Dynamics of a Particle, Miller's Hydrostatics, Lloyd's Optics and lectures on the wave theory of light, Herschel's Astronomy, and two of Airy's Tracts, with occasional reference to Du Hamel's Cours de Mecanique, and to Poisson's Works.

The Class of Experimental Physics is attended by the same Students, and also by Agricultural Students of the First Year, and by Medical Students of the Third Year. The subjects of these Lectures are taught entirely without mathematical demonstration, by the aid of experiments, illustrations, drawings, and models, and such works as Lardner's Hand book, Golding's Bird's Physics, Webster's Physics, Miller's Chemistry, Vol. 1, Arnott's Elements, Biot, Ganot, Pouillet, Peschel, and such like standard works are referred to, and recommended to the attention of the Students. The subjects of Heat, Electricity, and Electro-Magnetism are at present chiefly taught in the Chemical Class; but the leading facts and principles are taught by selections from Biot, Pouillet, Ganot, and Miller.

The Practical Mechanical Class is attended by Students in Engineering of the Second Year. The recent University ordinance will call for some change in this. The Lectures and instructions are given twice in the week. The subjects embraced are the nature and estimate of work done, the kinds of work required to be done; the nature and laws of friction, and other useless resistances; the moving powers at our command, their respective nature and the laws which govern their action; the manner in which they are, by machinery, connected with and opposed to the resistances; the construction of machines; the principles of strength of materials as opposed to strains; the equilibrium of structures, frames, roofs, arches, domes, the general principles of mechanism; general maxims in the structure and working of machines; maximum effects of machines; hydraulic engines; the steam engine. The works used as guides to the studies of the Students in this Class are selections from Lloyd's and Robinson's Mechanics, Willis's Principles of Mechanism, Barlow on Materials and Construction. Hodgkinson's Experimental Researches, Tredgold, Tate's Elementary Treatises and Exercises, and selected numbers of Weale's Rudimentary Series.

Chemistry.

Professor, Thomas Andrews, M.D., F.R.S., M.R.I.A.

In the Class of Chemistry the greater part of the Course is devoted to pure Chemistry; but the Elements of the Sciences of Heat and Electricity, particularly in their relations with Chemistry Proper, are also taught. The application of these sciences to the arts are particularly referred to; and it has been the constant endeavour of the Professor to communicate to the Students as precise and accurate information as possible on the subjects treated in his Lectures, and to train them to habits of careful observation and accurate thinking. With this view a weekly examination of the whole Class is held, at which the Students are subjected to a searching examination on the business of the preceding week; and further to encourage a taste for scientific inquiry, and also to train a certain number of practical chemists, a limited number of the best Students are admitted, by examination, as working pupils into the chemical laboratory, where they have an opportunity of acquiring a knowledge of chemical analysis. This latter arrangement has now been in practice for several years, and has already been attended with the best results.

Natural History.

Professor, George Dickie, M.D.

The Zoological Department of the Course occupies the First Term and greater part of the Second, and comprehends the Outlines of Anatomy and Physiology of animals, followed by Systematic Zoology, and remarks on the distribution of animals.

The Botanical part comprehends Vegetable Anatomy and Physiology, Systematic Botany, and distribution of vegetable forms. In addition to the Class Lectures (four days for Arts and five for Medical Students), meetings are held in the Botanic Garden, and practical excursions made into the neighbouring country.

The subject of Physical Geography is supplemental to the above Courses, and is delivered to Arts Students of the Third Year, during the First Term of the Session.

This Course comprehends chiefly Lectures on the structure and form of continents and islands; the distribution of mountain systems, rivers, and lakes; the ocean, its currents, temperature, &c.; the atmosphere, its currents, &c.; rain, snow, &c. The preceding subjects are considered in relation to the geographical distribution of animals and plants.

These different branches are illustrated by specimens, or drawings, or both, as the case may be.

Logic and Metaphysics.

Professor, Rev. James M'Cosh, LL.D.

Students attend this Class four days each week during twelve weeks of the Second Session. On two of these days there are examinations on a text-book of Formal Logic, with short prelections on the said text-book, and also the oral explanation of philosophic terms, the reading of Essays by the Students, and the criticism of them by the Professor. On the other two days the Professor delivers written Lectures. This Course of Lectures is divided into two parts: First, General Logic, or an Exposition of the Laws of Thought in general, that is, whatever be the object of thought, embracing Notions, Judgment, and Reasoning. Secondly, Particular Logic, or the Development of the Laws of Thought, as directed to particular classes of objects, comprising Demonstrative Evidence, Probable Evidence, Induction, Analogy, Teleology, and the Relation of the Organon of Bacon to that of Aristotle. The prominent topic in the second part is the Method of Induction, which is treated under the heads:—I. The Means, being generally Systematic Observation, and more particularly Analysis, Observation Proper, Experiment, Hypothesis, Explication of the Conception. II. The End, being the Discovery of Classes (as in Natural History, &c.), or Causes (as in Natural Philosophy, &c.). III. The Canons of Classes and Causes by which we may reach the End by the Means. The Students are required to give in a short written essay once a fortnight. At the Pass Examination, at the close, about one half of the questions bear upon subjects discussed in the text-book, and the other half upon topics explained in the lectures.

Metaphysics.

This Class meets four days each week, and an hour each day, during the first two terms of the session, and is attended by Students of the third year. On one of these days there is a rigid examination, with interspersed remarks by the Professor, on the second half of the Epitome of the History of Philosophy, sanctioned by the University of France (translated by Henry). In this part of the text-book there is an abstract of the doctrines of the more eminent philosophers who have flourished in this country, and on the Continent of Europe, from the time of Bacon to the present day. On another of these days there is an examination on the written lectures, together with the reading and criticism of essays, the Students being required to give in a carefully written essay every fortnight to the Professor, who reads it at home, and selects certain portions of it to be read in the class, where he criticises it. These essays are on the leading subjects discussed in the written lectures. On the other two days the Professor delivers carefully prepared written lectures. He begins the course with a few lectures on the Method of Investigation, which is that of Induction, and on Mind and Body, and then proceeds to divide his course into two parts, Psychology and Metaphysics Proper.

Under PSYCHOLOGY he treats (1) of the Powers or Faculties of the Mind, and (2) of the Laws of the Succession of Thought. He classifies the faculties as follows:—I. The Simple Cognitive Faculties: (*a*) Perception; (*b*) Consciousness. II. The Reproductive Faculties: (*a*) Memory; (*b*) Imagination; (*c*) Symbolic Power. III. The Faculties which Discover Relations: (*a*) of Identity and Difference; (*b*) of Whole and Parts (to which we owe abstractions); (*c*) of Space; (*d*) of Time; (*e*) of Quantity; (*f*) of Resemblance (to which we owe the Discovery of Classes), (*g*) of Active Property; and (*h*) of Cause and Effect. IV. The Conscience. V. The Emotions; and VI. The Will. In this course of lectures, which occupies two-thirds of the session, the method of operation, and peculiarities of these mental attributes, are carefully pointed out.

Under METAPHYSICS PROPER the Professor treats of the Native or Constitutional Principles which are in the Mind prior to Experience. He points out their true Psychological Nature, and shows that they are the fundamental laws or rules of the Faculties. He also specifies the tests, such as Self-evidence, Necessity, and Universality, by which they may be distinguished. He proves that they are in the constitution of the mind, and that they operate spontaneously, but that we can make a reflective or philosophic use of them only after we have detected their nature by a careful induction. He classifies them as the True, and the Morally Good. Under the first he treats (1) of Primitive Cognitions and Beliefs, such as Body, Spirit, Substance, Power, Space, Time, the Infinite; and (2) Primitive Judgment, such as Substance and Quality, Mathematical Axioms, Cause and Effect. Under the Good, without entering into the subject of Ethics, he shows that there is a fundamental distinction between Moral Good and Evil. He closes this course by showing how all these principles should conduct us to the belief in a Being who is at one and the same time the True and the Good.

Higher Class of Logic and Metaphysics.

This class is a small one, consisting only of about nine young men, who have been under the Professor the two previous sessions, most of whom have taken the Degree of B.A., and some of whom are preparing for Competitive Examinations. It meets two hours each week, during the first and second terms of the session. A considerably large course of reading is prescribed to the Student, on which he is examined by the Professor, who intersperses prelections of his own. Last session the Students went over, in Logic, Thomson's Outlines of the Laws of Thought, and portions of Mansell's Prolegomena, of Whewell's Philosophy of the Inductive Sciences, and of Mill's Logic; and in Metaphysics, the Philosophy of Ancient Greece, embracing portions of Butler's History and of Aristotle's Ethics; and also certain topics discussed in Kant's Critick of Pure Reason, and in Hamilton's Notes and Discussions. For several years the Professor delivered a Course of Lectures on the Correspondence between the Order of External Nature and the Laws of the Mind—this has since been published. Last year he lectured on the Intuitive Convictions of the Mind inductively investigated. These lectures, rewritten and with additions, have just been published by Murray, London.

GEOLOGY AND MINERALOGY.

Professor, Wyville Thomson, LL.D.

The Courses consist of lectures, demonstrations, and examinations. The Geological Course embraces the general principles of the science, and a detailed investigation of the palæontological, lithological, and economic characters of all the formations. The Students are exercised in the practical use of the necessary instruments, and in the construction of Geological maps and working sections. The characteristic fossils of the different formations are rendered familiar by the exhibition of specimens and models, and an excellent series of drawings. Drawings are also used for the illustration of the underground workings of mines of copper, coal, &c.

In the Mineralogical Course the Students are instructed in the most modern crystallography by models, and exercised with the reflecting goniometer. The electro-chemical classification of minerals is then explained, and an extensive suite of minerals in the museum is arranged on that system, for the instruction of the Students.

Once a week examinations are held, and additional explanations given of the subjects of the preceding lectures.

CIVIL ENGINEERING.

Professor, James Thomson, A.M., C.E.

The Professor of Engineering has two classes, the junior and the senior. In these the business is conducted by lectures, exercises, and examinations, together with field practice in Surveying, and office work in calculating and mapping. For practice in drawing, the Engineering students are formed into a class, conducted by the Teacher of Drawing, under the supervision of the Professor.

The Engineering Courses comprise the principles and practice of ordinary surveying and mapping, and of levelling and making sections, and drawing; and an Introduction to Practical Geodesy: also Descriptive Geometry, and other subjects in Mathematics or Natural Philosophy requisite to be taught or revised for special use in the Engineering Courses; properties and qualities of materials used in construction; science of the strength of materials in theory and practice; principles of engineering and architectural construction in general; together with an introduction to architecture as a fine art; lessons and exercises on specifications, estimates, and other subjects of engineering finance; instructions in various special branches of engineering and architectural construction, selected as being of very general importance in the profession.

The foregoing may be regarded as a general description of the business of the Engineering Classes. It is not the object of the Professor to adhere, from year to year, closely to a uniform course in respect to the particular branches to be taken up and treated in detail. It may suffice to mention, as examples of the principal subjects from which courses of detailed instructions are selected, or on which reading is recommended, the following:—foundations; bridges, both common and oblique; tunnels; roads; railroads; hydraulic engineering, including the principles of the flow of water in pipes and open channels, supplying towns with water, water-power, canals, rivers, drainage of fens, harbours, and subaqueous foundations; ventilation of buildings and mines; the steam engine.

The subjects of surveying, mapping, drawing, and descriptive geometry, and the principles of the instruments used in Surveying and Geodesy, together with some of the more elementary branches of the other subjects above enumerated, are treated of in the junior class. Then, in the senior class, there fall to be treated those subjects which require farther advancement in Mathematics, and those which have special reference to Engineering and Architectural Construction. Attendance on the Drawing Class, begun in the first year, is continued during the second year; and the senior students have also facilities afforded for forming parties for farther practice in surveying, under the supervision and advice of the Professor.

In the Session 1860–61 the Engineering Courses will be modified in accordance with the new Ordinance of the Queen's University, which prescribes an Engineering Curriculum extending over three Sessions, to candidates for the Diploma in Civil Engineering in ordinary cases, while still leaving it in the power of the College Council to pass students to the University, as qualified candidates for the Diploma, after residence for only two years, in cases in which their previous acquaintance with a sufficient group of the subjects prescribed for study in the first and second Sessions of the ordinary course shall be deemed by the Council satisfactory.

Appendix, No. 7.

Digest of Subjects and Courses.

AGRICULTURE.

Professor, John Frederick Hodges, M.D., F.C.S.

Theory of Agriculture.

The objects of this Course are to teach the principles of Agricultural Science. It includes an account of the origin and composition of soils, the structure and food of plants, and the composition and preparation of manures.

Practice of Agriculture.

The objects of this Course are to teach the young agriculturist how practice may be conducted in accordance with the principles of science, and the results of experience, and to describe the methods by which the largest amount of food may be profitably obtained from the soils of this country. It includes an account of the processes employed in the preparation of the soil for crops, draining, irrigation, &c., the history of the plants of the farm, and the economy of farm produce.

History and Diseases of Farm Animals.

In this Course the history, structure, and treatment of the animals of the farm, in health and disease, are described, and the relative value and economical preparation of the various substances used in feeding explained.

All the Lectures in these Courses require an extensive series of illustrations, and efforts have been made to obtain suitable collections of apparatus, models, &c.; a most valuable collection of drawings has been provided for the demonstration of the structure and forms of animals, and numerous specimens of seeds, &c., have been presented to the College. As the history of the treatment and technical management of the flax plant, which affords the raw material of the staple manufacture of Ireland, is regarded as an important department of the duties of an Agricultural Professor in Ulster, the chief seat of the flax industry, a complete series of flax implements and specimens has been placed in the museum.

The Students are examined frequently during the Session, and required to write abstracts of the lectures. By these means their attention is secured, and their progress ascertained. Excursions are also made to implement and manure manufactories, and they attend the monthly meetings of the Chemico-Agricultural Society of Ulster, which are held in Belfast.

The influence which the young men thus trained must, in future years, exercise on the agriculture of Ireland, may be expected to produce the most beneficial results.

ANATOMY AND PHYSIOLOGY.

Professor, Hugh Carlile, A.M., M.D., M.R.I.A.

The Department of Anatomy and Physiology comprises the Lectures on Anatomy and Physiology, and Practical Anatomy. The Lectures on Anatomy and Physiology consist in the exhibition of carefully dissected portions of the recent human body and of the bodies of other animals, and of anatomical preparations of the more delicate structures, preserved in spirits of wine, and by various other means, and in the description of the forms, relations, and intimate structure of all the organs of the body, and the explanation of the functions of every part. Comparative Anatomy is largely used for the purpose of illustrating analogous structures and functions in man, and morbid preparations are employed in order to exhibit the changes of organization induced by disease. Enlarged copies of microscopic drawings are also much employed in these Lectures, as affording the best means of conveying to a large number of individuals, at the same time, a correct knowledge of minute anatomical structure, and from time to time, a series of very fine preparations of the minute structure of the various organs, is exhibited to the members of the class by means of microscopes. These Lectures are given on the first five days of the week, and examinations of the Lecture Class are frequently held, and the answering recorded.

Practical Anatomy is understood to comprehend dissection of the dead body, and anatomical demonstrations. The dissections are carried on under the superintendence of the Professor of Anatomy and Physiology and the Demonstrator of Anatomy, during the whole week, at all convenient hours not occupied by Lectures or Demonstrations. Each Student is required to dissect during the Session, at least one-half of a subject, so that every portion of the body, the right and left side being upon the whole, symmetrical, shall come under his observation. The bodies are so prepared, by a preserving process, that decomposition is arrested for a time sufficient to admit of the complete dissection of the several parts; and, since the opening of this College, no serious case has occurred of any of those diseases which the dissection of unpreserved subjects so frequently produces.

The anatomical demonstrations form a course of instruction of a more elementary nature than the Lectures on Anatomy and Physiology. They deal more with the forms and positions of parts, in reference to their anatomical and surgical relations, than with their intimate structure, functions, or homologies; and they are confined more strictly to the human subject in its healthy or normal condition, Comparative Anatomy and Pathology not forming any considerable part of the Course. They are given on the first five days of the week, and are interspersed with frequent examinations.

The Lectures on Anatomy and Physiology are given at Queen's College, in the vicinity of the museum containing the preparations required for their illustration; while, from the absence at the College of any apartments whatever for the purposes of dissection and anatomical demonstration, these are carried on in a building hired for the purpose, at the distance of a mile from the College. This building is in a damp and unwholesome situation, confined in space, and otherwise very unsuitable for the purposes to which it is applied. Its distance from the College involves much loss of time to Students, in going to and fro, during the intervals of Lectures, and seriously curtails those portions which they would otherwise most profitably employ in acquiring, by dissection, sound and practical anatomical knowledge. There can be no doubt, that the inconvenience thus sustained by the Students, tends to diminish the number attending the medical department of the College. Frequent and urgent applications have been made to the various Governments which have been in power since the opening of the College in 1849, for means to provide suitable anatomical apartments within the precincts of the College grounds, but hitherto without any satisfactory result.

PRACTICE OF MEDICINE.

Professor, John Creery Ferguson, M.A., M.B., *Hony. Fellow King and Queen's Coll. Phys. &c.*

The Class meets four times each week, from the first week of November to the last of the following April.

An examination is held usually once a fortnight. The Course embraces the principles of Inflammation, Fevers, the diseases, organic and functional, of the viscera of the three great cavities of the human body. In treating of individual diseases, their pathology, semeiology, ætiology, and treatment, are the subjects chiefly dwelt on. Wherever it is possible, pathology is illustrated by the preparations afforded by our museum, by drawings and plates, or by recent specimens. It may be added, that the Professor's present connexion with the Belfast General Hospital adds greatly to the means of making his Course more useful and interesting to Students.

THEORY AND PRACTICE OF SURGERY.

Professor, Alexander Gordon, M.D.

Four Lectures are delivered weekly during the Medical Session. An examination is held each day on the subject of the preceding day's Lecture. Each Course comprises the following subjects :—

Inflammation,
Suppuration,
Mortification,
Erysipelas,
Burns,
Ulcers,
Wounds,
Hæmorrhage,
Diseases of the Arteries,
,, Veins,
Fractures of Trunk and Extremities,
,, Cranium, Injuries of the Brain and Scalp,
Dislocations,
Diseases of the Joints,
Diseases of the Bursæ,
,, Bone, benign and malignant,
,, the Jaws and Mouth,
,, the Fingers and Toes,
,, Female Breast,
,, Anus and Rectum,
,, Testis,
,, Hernia,
,, Prostate,
,, Bladder,
,, Eyes,
,, Larynx,
Syphilis,
Gonorrhœa,
Stricture.

To meet the requirements of the Army Medical Service, the Professor delivers a separate Course of Lectures on Operative Surgery.

All the capital and minor operations are performed on the dead subject by the Students, under the superintendence of the Professor. A Dissecting Room in the College would be highly advantageous to the Surgical Student, as the Professor would be thereby enabled to make the Course of Operative Surgery more extensive, and it would afford additional facilities for instruction in Surgical Anatomy.

MATERIA MEDICA.

Professor, James Seaton Reid, M.D.

This Course includes—

1st. General Pharmacology, or the modes in which medicines act upon the living organism in a state of health.

2nd. Therapeutics, or the modes in which medicines act as curative agents.

3rd. Pharmacy.

4th. Dietetics—a review of the different kinds of food used in health and in disease.

5th. Special Pharmacology, or the history, composition, uses, and modes of administering medicinal agents for the cure of disease.

The Class meets four times each week. An examination is held once every week.

MIDWIFERY.

Professor, William Burden, M.D.

Lectures four times a week, during the six winter months, consist of following subjects :—

Anatomy of the pelvis, so much as is required for midwifery. Its measurement and pelvimeters.

Contents of the pelvis. The functions of the uterus in its virgin state.

Conception—length of gestation—changes of the uterus and its appendages during gestation.

Growth of child from its earliest seen form until its full parasitic size.

Graafian vesicle and corpus luteum. Fœtus, its circulation, signs of maturity, weight, and length.

Plural births.

Proportion of births and deaths of males to females.

Superfœtation.

Signs of pregnancy.

Signs of approaching labour.

Natural labour, its progress, also the positions and progress of child till its separation from its mother.

Management of natural labour, including the arrangement of the bed and bed-room, and the proper dress and posture of the patient.

Tedious labour, its causes and treatment.

Labour requiring the use of instruments; their application taught on models in the class.

Cæsarean section and Sequltean operation—how to prevent the fœtus from getting large in uterus.

Premature labour—how to bring it on, and when it is necessary to do so.

Cross-births and their treatment.

Abortion—how to prevent it.

APPENDIX, No. 7.

Digest of Subjects and Courses.

Extra uterine fœtations—how they occur, and their treatment.

Management of women after delivery, and treatment of such accidents and diseases as occur at this period.

Management of children after birth, washing, dressing, food, &c., and the choice of a wet-nurse, and treatment of such accidents as take place at this period, or soon after.

Practical midwifery taught by pupils attending patients in their own houses and in the Lying-in-Hospital.

MEDICAL JURISPRUDENCE.

Professor, Dr. Hodges.

The Lectures in this Course are delivered twice weekly during six months. They include an account of the history and chemical investigation of poisons, and of the various subjects respecting which the evidence and assistance of Medical Practitioners may be required in Courts of Law. Experimental illustrations of the methods to be pursued in medico-legal inquiries are given, and frequent examinations held to test the progress of Students. No salary has been allocated to the Teacher of this department, and the duties, at the request of the Council, have, since the opening of the College, been performed by Dr. Hodges.

ENGLISH LAW.

Professor, Echlin Molyneux, Q.C.

The Professor of English Law, in conducting his department, has constantly kept in view the object of the Select Committee of the House of Commons in recommending the foundation of Chairs in Law in connexion with the Queen's Colleges, which, as they stated in their Report on Legal Education, was not merely to prepare Candidates for the Bar, and for the profession of Attorney and Solicitor, but to raise the standard of legal attainments amongst local practitioners, and especially to provide opportunities of legal education to qualify persons intended to fill administrative situations not strictly legal—a policy which has been since followed up by the Legislature conferring privileges, by way of inducement, on Candidates for the profession of attorney and solicitor, who shall avail themselves of these Schools of Law.

The Course of the *First* year, in this department, comprehends the elements of real and personal property, with the principles of conveyancing; that of the *Second* consists of an introduction to the principles and practice of Courts of Equity and the law of bankruptcy; the *Third* course includes the common law as incident to contracts, the nature and form of remedies by civil action, and an outline of criminal law, theoretical and administrative, which last completes the Curriculum of instruction required for the attainment of the Diploma of Elementary Law in the Queen's University. The subjects prescribed for Students of the *Fourth* year to qualify them for the Degree of LL.B., embrace a more extended and detailed course of the subjects already enumerated, including the law of wills, powers, evidence, and procedure.

The Lectures are made auxiliary to the cotemporaneous studies directed, and are accompanied by interrogation, independent of the General Examination and that for Honors. Such books, cases, and decisions, and portions of treatises are pointed out for reading as are considered by the Professor most useful in elucidating a branch of learning which is scarcely furnished with books exclusively intended for instruction; and no efforts have been spared to point out the peculiarities of the law in Ireland, whether proceeding from statutes or inherent diversity of practice, or to direct attention to the recent changes which have been introduced into the course of procedure.

From the first opening of the College to the present time, the successive classes have spontaneously applied themselves with assiduity and perseverance to the various subjects of legal instruction, and several Non-Matriculated Students have, from time to time, availed themselves of the privilege afforded by the College

Appendix, No. 7.

Digest of Subjects and Courses.

Ordinances, of attending detached Courses of the Lectures on selected subjects.

Under these circumstances, the Professor is gratified at being able to give the assurance that the Faculty of Law has fully realized the object of its founders, and that a further extension of its public benefits would ensue upon the adoption, by Government, of the suggestion made by the same Committee of the House of Commons, that a preference should be given to candidates for situations in the civil service, not of a purely legal nature, who could produce testimonials of legal attainments from those institutions—a rule which would fully accord with the principle laid down in a recent report of another Committee in relation to the civil service.

JURISPRUDENCE AND POLITICAL ECONOMY.

Professor, T. E. Cliffe Leslie, LL.B.

The subjects embraced in the course of lectures on *Jurisprudence* are, according to the regulations of this College, (1) the Elements of Jurisprudence, (2) Civil Law, (3) Constitutional Law, (4) Colonial and International Law.

In the treatment of these subjects, both the *Historical* and *Philosophical* Methods are followed in the lectures of the Professor. The Historical Method, for example, is applied in tracing the principal changes through which the laws of England have passed, the assignable causes of such changes, and the degree and manner in which, in comparison with the laws of Continental Europe, the laws of this kingdom have been affected by contact with the principles of Roman legislation. The method of Philosophical Analysis, on the other hand, is applied in investigating the doctrines of the foundation and classification of rights, the several parts and legitimate form of a complete code, the relation of Scientific Jurisprudence to other departments of Social Philosophy, and the means of improving the state of Positive Law as deducible from such considerations.

The subjects which a course of lectures on *Political Economy* must embrace are fewer and more definite than those classed under the less advanced and more complicated Science of Jurisprudence. It is the Professor's endeavour to illustrate the principles of Economic Science by the help of those practical applications which will be most interesting and useful in a large commercial town.

Appendix, No. 8.

General Class Examination.

APPENDIX, No. 8.

GENERAL CLASS EXAMINATION at the end of the SESSION 1858–59.

FIRST YEAR STUDENTS.

GREEK.—*Examiner, Professor MacDouall.*

I.—1. Translate accurately these lines from the *Phoenissae* of EURIPIDES :—

ΠΑΙΔ. ὦ κλεινὸν οἴκοις, Ἀντιγόνη, θάλος[14] πατρί!
ἐπεί σε μήτηρ παρθενῶνας[15] ἐκλιπεῖν[1]
μεθῆκε[2] μελάθρων[16] εἰς διῆρες[17] ἔσχατον,
στράτευμ' ἰδεῖν Ἀργεῖον, ἱκεσίαισι[18] σαῖς,
ἐπίσχες,[3] ὡς ἂν προυξερευνήσω στίβον,
μή τις πολιτῶν ἐν τρίβῳ φαντάζεται,
κἀμοὶ μὲν ἔλθῃ[4] φαῦλος, ὡς δούλῳ, ψόγος,
σοὶ δ' ὡς ἀνάσσῃ· πάντα δ' ἐξειδὼς[5] φράσω,
ἅ τ' εἶδον εἰσήκουσά τ' Ἀργείων πάρα,
σπονδὰς[19] ὅτ' ἦλθον σῷ κασιγνήτῳ[20] φέρων
ἐνθένδ' ἐκεῖσε δεῦρό τ' αὖ κείνου πάρα.
ἀλλ'—οὔτις ἀστῶν[21] τοῖσδε χρίμπτεται δόμοις—
κέδρου παλαιὰν κλίμακ'[22] ἔκπειρα[6] ποδί,
σκόπει[7] δὲ πεδία[23] καὶ παρ' Ἰσμηνοῦ ῥοὰς
Δίρκης τε νᾶμα,[24] πολεμίων στράτευμ' ὅσον.
ΑΝΤ. ὄρεγέ[8] νυν, ὄρεγε γεραιὰν νέᾳ
χεῖρ' ἀπὸ κλιμάκων, ποδὸς ἴχνος ἐπαντέλλων![9]
ΠΑΙΔ. ἰδού· ξύναψον,[10] παρθέν'! εἰς καιρὸν δ' ἔβης[11]
κινούμενον γὰρ τυγχάνει[12] Πελασγικὸν
στράτευμα, χωρίζουσι δ' ἀλλήλων λόχους.[25]
ΑΝΤ. ἰὼ πότνια[26] παῖ Λατοῦς, Ἑκάτα!
κατάχαλκον ἅπαν πεδίον ἀστράπτει!
ΠΑΙΔ. οὐ γάρ τι φαύλως[27] ἦλθε Πολυνείκης χθόνα,
πολλοῖς μὲν ἵπποις, μυρίοις δ' ὅπλοις βρίμων.
ΑΝΤ. ἆρα πύλαι κλῄθροις[28] χαλκόδετά[29] τ' ἔμβολα[30]
λαϊνέοισιν[31] Ἀμφίονος ὀργάνοις[32] τείχεος ἥρμοσται;[13]
ΠΑΙΔ. θάρσει· τά γ' ἔνδον ἀσφαλῶς ἔχει πόλις.

2. $^{1-13}$ Parse accurately and fully each of these verbs, giving the first person singular indicative of every one of their tenses actually occurring in Attic, but mentioning none that are not found in use.

3. $^{14-32}$ Derive each of these nouns, parsing only such as may present some noticeable peculiarity.

4. Explain the construction of (*a*) οἴκοις and πατρὶ in the 1st line,—(*b*) ἱκεσίαισι σαῖς in the 4th,—(*c*) ὡς ἂν προυξερευνήσω in the 5th,—(*d*) μὴ φαντάζεται καὶ ἔλθῃ in the 6th and 7th.

5. Point out any words or forms of words, occurring in these lines, which are not used in prose, and in each case give a prosaic substitute.

II.—1. Point out the metrical faults introduced into the following lines, specify the rules which they severally violate, and restore the correct iambic measure :—

ὁ τῆς ἀληθείας μῦθος ἁπλοῦς ἔφυ
κοὐ τἄνδιχ' ἑρμηνευμάτων δεῖ ποικίλων·
αὐτὰ γὰρ ἔχει καιρόν· ἄδικος δ' ὁ λόγος
ἐν αὑτῷ νοσῶν σοφῶν δεῖται φαρμάκων.

* * * * *

ἀνανδρία γάρ, ὅστις ἀπολέσας τὸ πλέον
ἔλαβε τοὔλασσον· αἰσχύνομαι δὲ τοῖσδε πρὸς,
τόνδε σὺν ὅπλοις ἐλθόντα καὶ γῆν πορθοῦντα
τυχεῖν ἃ χρῄζει.

2. Mention the restrictions as to the use of the trisyllabic feet in the several places of the Tragic trimeter.

3. (*a*) Give general rules for the weight of the syllable formed when one word ends in a short vowel and the next begins with two consonants—a mute and a liquid. (*b*) Distinguish the Tragic usage, in this respect, from the Homeric on the one hand and the Comic on the other.

LATIN.—*Examiner, Rev. Dr. Reichel.*

Translate the following extracts :—

I. Quodsi ne injuriae quidem, quae tibi ab illo facta sit, causa remanet, quid habes quod possis dicere, quamobrem non modo mihi, sed cuiquam anteponare? Nisi forte illud, quod te dicturum esse audio, quaestorem illius fuisse. Quae causa gravis esset, si certares mecum, uter nostrum illi amicior esse deberet: in contentione suscipiendarum inimicitiarum ridiculum est putare, causam necessitudinis ad inferendum periculum justum videri oportere. Etenim, si plurimas a praetore tuo injurias accepisses, tamen eas ferendo majorem laudem quam ulciscendo mererere: quum vero nullum illius in vita rectius factum sit quam id quod tu injuriam appellas, hi statuent hanc causam, quam ne in alio quidem probarent, in te justam ad necessitudinem violandam videri? Qui, si summam injuriam ab illo accepisti, tamen, quoniam quaestor ejus fuisti, non potes eum sine ulla vituperatione accusare: si vero non ulla tibi facta est injuria, sine scelere eum accusare non potes. Quare, quum incertum sit de injuria, quenquam horum esse putas, qui non malit te sine vituperatione, quam cum scelere discedere?

II. Judiciorum desiderio tribunicia potestas efflagitata est: judiciorum levitate ordo quoque alius ad res judicandas postulatur: judicum culpa atque dedecore etiam censorium nomen, quod asperius antea populo videri solebat, id jam poscitur, id jam populare atque plausibile factum est.

III. Quae signa nunc, Verres, ubi sunt? Ille quaero, quae apud te nuper ad omnes columnas, omnibus etiam intercolumniis, in silva denique disposita sub divo vidimus. Cur ea, quamdiu alium praetorem cum iis judicibus, quos in horum locum sortitus esses, de te in consilium iturum putasti, tamdiu domi fuerunt? postea quam nostris testibus nos, quem horis tuis, uti malle vidisti, nullum signum domi reliquisti praeter duo quae in mediis aedibus sunt, quae ipsa Samo sublata sunt. Non putasti me tuis familiarissimis in hanc rem testimonia demonstraturum, qui tuae domi semper fuissent, ex quibus quaererem signa scirentne fuisse quae non essent? Quid tum hos de te judicaturos arbitratus es, quum viderent, te jam non contra accusatorem tuum, sed contra quaestorem sectoremque pugnare?

1. Define the *quaestiones perpetuae*, and state which of these was the earliest in appointment, and the date of its institution.

2. Of whom did the jury consist at Verres' trial? What fluctuations had the constitution of juries in criminal trials undergone previously, and what final settlement was made in the same year?

3. Define the *comperendinatio* and *ampliatio*. Which of these was allowed by the *lex Servilia* and which by the *lex Acilia*?

4. Give a brief sketch of the history of Verres' trial; stating the year in which it took place, the day on which it began, the name of the presiding judge, the various artifices resorted to by Verres in order to escape, and the manner in which Cicero conducted it, so as to elude these artifices, and finally to insure conviction.

5. Under what law was Verres tried? What was the penalty on conviction under that law?

6. In what years had Verres been propraetor of Sicily? and what was the reason of the prolongation of his propraetorship?

7. What is the meaning of the term "Divinatio," as applied to the first oration of the set against Verres? What is the argument of Cicero in that oration?

8. How many of the Verrine orations were actually delivered?

9. State the mode of procedure in impeachments at Rome.

10. What was the *edictum praetorus* often alluded to in these orations? and what was the difference between the *edictum perpetuum* and the *edictum tralaticium*?

11. Give the technical meanings of the words and phrases—*sector*, *quadruplator*, *vadimonium*, *manceps*, *subscriptor*, *manupretium*, or *manus pretium*, *corona*, *a subselliis*, *sartum tectum*, *secundi haeredes*, *trierarchus*, *sponsio*, *praes*, *lapis redivivus*, *pecuniam ponere* and *exigere*, *syngrapha*.

12. Explain the long ā in *posteā antеā*, and adduce analogy in favour of your explanation.

Translate :—

Fenus agitare et in usuras extendere ignotum: ideoque magis servatur quam si vetitum esset. agri pro numero cultorum ab universis in vices occupantur, quos mox inter se secundum dignationem partiuntur. facilitatem partiendi camporum spatia praestant. arva per annos mutant: et superest ager. nec enim cum ubertate et amplitudine soli labore contendunt, ut pomaria conserant et prata separent et hortos rigent: sola terrae seges imperatur. unde annum quoque ipsum non in totidem digerunt species: hiems et ver et aestas intellectum ac vocabula habent: auctumni perinde nomen ac bona ignorantur.

Explain the phrase *fenus in usuras extendere* in the above extract.

What is the nominative to *servatur* in the first sentence?

Translate into Latin prose :—

This illustrious man is a person of as much virtue as can possibly consist with the love of power, and his love of power is no greater than what is common to men of his superior capacities: neither did any man ever appear to value it less after he had obtained it, or exert it with more moderation. He is the only instance that ever fell within my memory or observation, of a person passing from a private life through the several stages of greatness without any perceivable impression upon his temper or behaviour. As his own birth was illustrious, so he seemed to value that accidental advantage in himself and others more than it could pretend to deserve. He abounded in good-nature and good-humour, though subject to passion, as I have heard it affirmed by others, and owned by himself: which, however, he kept under the strictest government till toward the end of his administration, when he began to grow soured and to suspect his friends,—and, perhaps, thought it not worth his pains to manage any longer.

APPENDIX,
No. 8.

General Class
Examination.

ENGLISH LANGUAGE.—*Examiner, Professor Craik.*

1. Explain, and illustrate by examples, what is meant by the Internal Evidence which a language may afford us of its connexion with any other language.

2. Enumerate in chronological order the leading facts constituting the External Evidence which we have for the History of the English Language from our earliest acquaintance with it down to the fourteenth century.

3. Explain what modern philologists mean by what they call—1. The Saxon or Anglo-Saxon Language; 2. Semi-Saxon; 3. Early English; 4. Middle English; 5. Modern English.

4. Give an account of the principal literary compositions that we possess, and that have been printed, in what are called Semi-Saxon and Early English.

5. Specify and define correctly the three distinct forms which the English language has successively assumed since the date at which it first became known to us.

6. State what appears to be the amount in our present English—1. Of Celtic; 2. Of what has been called Latin of the First Period; 3. Of Latin of the Second Period; 4. Of Latin or French, subsequently introduced.

7. Give the dates of Cæsar's visits to Britain; of the arrival of Hengist and Horsa; of the first recorded descent of the Danes; of the Conquest of England by Canute the Great; of the Norman Conquest; and of the birth and death of Chaucer.

8. State the parts of the Continent from which the Jutes, Saxons, and Angles are said to have severally come, and the parts of Britain which they severally settled in and took possession of.

9. Give an account of the origin of the French language, of its name, and of that of the country in which it was spoken, and of its two great ancient dialectic forms, and of its introduction into England.

10. State who the Normans were; when, under what leader, and in the reign of which French king they acquired their settlement in France; when and under whom they invaded and conquered England; and what language they then spoke.

11. Explain and illustrate by examples the manner in which the short and shut sound of the vowel is indicated in the mode of spelling adopted in the work called the Ormulum.

12. Give an account of the four ways in which, according to Mr. Guest, the long name sound of the vowel has at different periods been indicated in English orthography.

13. State the principal recorded or ascertained facts with regard to the employment of the French language in England during the first three centuries after the conquest, in literature, in social intercourse, in grammar schools, in legislative proceedings, documents, and records, and in the courts of law.

14. Sketch the history of the French and of the vernacular tongue in England throughout the first three centuries after the Norman Conquest, by centuries and by kings' reigns.

15. What are Chaucer's forms for To have, We have, We had, We shall, We should, I can, We can, We could, You, Them, Their, Her, He loved, We loved, He was loved?

MODERN LANGUAGES.—*Examiner, Dr. Frings.*

FRENCH.

J'avais dix-sept ans, et j'achevais mes études de philosophie à Amiens, où mes parents qui sont d'une meilleures maisons de Paris, m'avaient envoyé. Je menais une vie si sage et si réglée, que mes maîtres me proposaient pour l'exemple du Collége; non que je fisse des efforts extraordinaires pour mériter cet éloge; mais j'ai l'humeur naturellement douce et tranquille: je m'appliquais à l'étude par inclination, et l'on me comptait pour des vertus quelques marques d'aversion naturelles pour le vice. Ma naissance, le succès de mes études, et quelques agréments extérieurs m'avaient fait connaître et estimer de tous les honnêtes gens de la ville.

J'achevai mes exercices publics avec une approbation si générale, que monsieur l'évêque, qui y assistait, me proposa d'entrer dans l'état ecclésiastique, où je ne manquerais pas, disait-il, de m'attirer plus de distinction que dans l'ordre de Malte, auquel mes parents me destinaient. Ils me fesaient déjà porter la croix. Les vacances arrivant, je me préparais à retourner chez mon père, qui m'avait promis de m'envoyer bientôt à l'Académie.—JULES JANIN.

FRENCH OR GERMAN.

Our knowledge of the chain of intellectual and corporeal beings is very imperfect; but what we do know gives us exalted ideas of that variety and progression which reign in the universe. A thick cloud prevents us recognising the most beautiful and magnificent parts of this immense chain of beings.

Man, even by his external qualities, stands at the head of this world. His relations are more extensive, and his form more advantageous, than those of any other animal. His intellectual powers, when improved by society and science, raise him so high, that if no degrees of excellence existed among his own species, he would leave a great void in the chain of beings. Were we to consider the characters, the manners, and the genius of different nations, different provinces and towns, and even of the members of the same family, we should imagine that the species of men were as various as the number of individuals. How many gradations may be traced between a stupid Huron or a Hottentot and a profound philosopher! Here the distance is immense; but nature has occupied the whole by almost infinite shades of discrimination.—*Smellie's Philosophy of Natural History.*

FRENCH.

1. Give two examples in French, the one where the two Personal Pronouns, *se me* or *se nous*, &c., are immediately connected, and the other where they are disconnected, that is to say, where *me* or *nous* must go after the Verb and changed into *à moi, à nous.*

2. When is the Past Participle, in French, flexible?

3. Enumerate as many Verbs as you remember which govern an indirect case in French, while in English they are used with a direct case.

4. State what you know of the mechanism of a French sentence, especially with reference to *Personal Pronouns* and *Negative Adverbs.*

5. Is it arbitrary, in French, to place the Adjective either before or after the Noun? If not, state the difference.

6. When is the Relative Pronoun *lequel*, &c., generally used in preference to *qui*?

7. Translate into French: "I have punished the boy whose conduct your brother blamed so much." "I have punished the boys with whose conduct your brother was so much displeased."

8. When is the Particle *en* to be introduced into a French sentence?

MATHEMATICS.—*Examiner, Professor Tait.*

ALGEBRA.

1. Show that

$$3abc-a^3-b^3-c^3=(a+b+c)(ab+ac+bc-a^2-b^2-c^2).$$

2. Add together

$$\frac{1}{(a-b)(a-c)(x+a)},\quad \frac{1}{(b-a)(b-c)(x+b)}\text{ and}$$

$\frac{1}{(c-a)(c-b)(x+c)}$; and show that if $r^2=x^2+y^2+z^2$, and $r_1^2=a^2x^2+b^2y^2+c^2z^2$, the equations

$$\frac{a^2x^2}{a^2-r^2}+\frac{b^2y^2}{b^2-r^2}+\frac{c^2z^2}{c^2-r^2}=0,\text{ and}$$

$$\frac{x^2}{b^2c^2-r_1^2}+\frac{y^2}{a^2c^2-r_1^2}+\frac{z^2}{a^2b^2-r_1^2}=0 \text{ are equivalent.}$$

3. Enunciate and prove the rule for the extraction of the square root of an algebraic expression, and find to five terms that of $1+x+x^2$.

4. In a determinant of the third order lines may be changed into columns, and *vice versâ.*—Also, if two lines or columns be identical the determinant vanishes.

Solve by determinants the system

$$\left.\begin{aligned}13x+15y+17z&=16\\21x+20y+23z&=22\\10x+11y+10z&=12\end{aligned}\right\}$$

5. What can be gathered from

$$\left\{\begin{aligned}ya^{x\log y}&=xb^{y\log x}\\x\log.a&=y\log.b\end{aligned}\right\}?$$

Are they necessarily consistent?

6. Enunciate and prove the rule for changing the expression of a number from one scale to another.

Divide 422542 by 1134 in the scale of 6,
and 91 *t* 52 by 27 *t* in that of 12.

Compare the quotients in the scale of 3.

Extract the cube root of 1400631 in the scale of 7.

7. Find the sum of the cubes of the natural numbers from 1 to n, and thence show that when $n=\infty$,

$$\frac{1}{n^4}\,\Sigma_1^n r^3=\frac{1}{4}.$$

8. If C_r^n be the coefficient of x^r in the expansion of $(1+x)^n$

$$\alpha)\qquad C_r^{n+1}=C_r^n+C_{r-1}^n$$

$$\beta)\qquad \varepsilon=\frac{\Sigma_1^n\frac{1}{\lfloor r}C_r^{nx}}{\Sigma\frac{(C_1^n)^{p_1}}{\lfloor p_1}\frac{(C_2^n)^{p_2}}{\lfloor p_2}\cdots\cdots\frac{(C_n^n)^{p_n}}{\lfloor p_n}}$$

where ε is the base of Napier's logarithms, and the *p*s are integers such that $\Sigma(sp_s)=r$.

9. A bag contains 3 sovereigns and 5 shillings—*A* and *B* draw each a coin alternately till the bag is empty. Compare their expectations.

10. Show that the numerator of the difference between any two consecutive convergents to a continued fraction is unity. Apply this properly to solve $3x+5y=53$ in positive integers. Give a limit to the number of such solutions of $ax+by=c$.

TRIGONOMETRY, &c.

1. A polygon being inscribed in a circle, show that if the number of its sides be *even*, an infinite number of polygons with sides parallel to those of the former can be inscribed. Why is this not true if the number of sides be odd?

2. *AOC* is a triangle inscribed in a circle, *AC* meets the tangent at *O* in *D*, *BD* touches the circle in *B*. Show that *OB* bisects any line parallel to *OD* and limited by *AO*, *OC*.

3. If a straight line be perpendicular to each of two other straight lines at their point of intersection, it is perpendicular to the plane containing them.

4. Give a method of drawing tangents to an ellipse from an external point, and show that *two*, and *only two*, can be drawn.

5. A parabola is completely determined by two points and the directrix.—What is the locus of the foci of all parabolas which pass through two given points, and have their axes parallel to a given line?

6. In the parabola the ordinate to any diameter is a

mean proportional between the abscissa and four times the focal distance of the vertex of the diameter.

7. Define (as lines in the unit circle) the tangent and secant of any angle, and trace their changes in sign and magnitude as the angle increases from 0 to 2π.

8. Find expressions for the sine and cotangent of 18° and construct the (simplest) angle whose tangent is

$$\sqrt{\sqrt{5}+1}.$$

9. Expand in sines or cosines of multiples of θ; $(\cos\theta)^4$, $(\cos\theta)^5$ and $(\sin\theta)^5$.

10. What is the value of $\sin\left(\sin\left(\ldots\ldots\sin\theta\right)\right)$ or $\sin^n\theta$ and $\cos^n\theta$ when n is indefinitely great?

11. Show that (whatever quantities be represented by $x_0, x_1, \ldots\ldots x_n$)

$$\tan^{-1}x_n-\tan^{-1}x_0=\tan^{-1}\frac{x_n-x_{n-1}}{1+x_nx_{n-1}}+\tan^{-1}\frac{x_{n-1}-x_{n-2}}{1+x_{n-1}x_{n-2}}$$

$$+\&c.\ \&c.+\tan^{-1}\frac{x_1-x_0}{1+x_1x_0}.$$

Hence find the sum of the arcs whose tangents are

$$\frac{1}{3},\ \frac{1}{7},\ \frac{1}{13},\ \frac{1}{21},\ \&c. \text{ to infinity.}$$

12. Given two sides and the contained angle in any triangle, find the other side and angles. Find the latter to seconds with the following data:

$b=8$ $C=46°\ 8'$ L tan 17° 45′ = 9·5051500

$a=25$ log 2 = ·3010300 L tan 27° 15′ = 9·7118358

L tan 50° 23′ = 10·0820945

D for 1″ = 2572.

13. Prove the truth of the formula for proportional parts in the case of the functions $\log_{10}x$, $\sec\theta$ and L $\tan\theta$. For what values of θ is it inapplicable in the two latter cases?

SECOND YEAR STUDENTS.

GREEK.—*Examiner, Professor MacDouall.*

1. Translate with accuracy and spirit these lines from the *Birds* of ARISTOPHANES:—

ΠΕΙΣΕΤΑΙΡΟΣ.

ὃ δὲ δεινότατόν γ' ἐστὶν^{1} ἁπάντων, ὁ Ζεὺς γὰρ^{1} ὁ νῦν βασιλεύων
αἰετὸν^{3} ὄρνιν^{1} ἕστηκεν^{2} ἔχων ἐπὶ τῆς κεφαλῆς βασιλεὺς^{3} ὤν·
ἡ δ' αὖ θυγάτηρ γλαῦχ',^{3} ὁ δ' Ἀπόλλων ὥσπερ^{1} θεράπων^{1}
ἱέρακα.^{3}

ΕΥΕΛΠΙΔΗΣ.

νὴ τὴν Δήμητρ' εὖ ταῦτα λέγεις. τίνος εἵνεκα^{2} ταῦτ' ἆρ' ἔχουσιν;

ΠΕΙΣΕΤΑΙΡΟΣ.

ἵν', ὅταν θύων τις ἔπειτ' αὐτοῖς εἰς τὴν χεῖρ', ὡς νόμος ἐστί,^{3}
τὰ σπλάγχνα διδῷ, τοῦ Διὸς αὐτοὶ πρότεροι τὰ σπλάγχνα λάβωσιν.
ὤμνυ^{1} δ' οὐδεὶς τότ' ἂν^{1} ἀνθρώπων θεόν, ἀλλ' ὄρνιθας^{1} ἅπαντες·
Λάμπων^{3} δ' ὄμνυσ' ἔτι καὶ νυνὶ τὸν χῆν',^{3} ὅταν ἐξαπατᾷ τι·
οὕτως ὑμᾶς πάντες πρότερον μεγάλους ἁγίους τ' ἐνόμιζον·
νῦν δ' ἀνδράποδ',^{3} ἠλιθίους,^{3} Μανᾶς·^{3}
ὥσπερ^{1} δ' ἤδη τοὺς μαινομένους^{1}
βάλλουσ' ὑμᾶς κἀν τοῖς ἱεροῖς.^{2}
πᾶς τις ἐφ' ὑμῖν ὀρνιθευτὴς
ἵστησι βρόχους, παγίδας,^{2} ῥάβδους,
ἕρκη, νεφέλας,^{3} δίκτυα, πηκτάς·^{2}
εἶτα λαβόντες πωλοῦσ' ἀθρόους·^{2}
οἱ δ' ὠνοῦνται βλιμάζοντες·^{2}
κοὐδ' οὖν, εἴπερ ταῦτα δοκεῖ δρᾶν,
ὀπτησάμενοι παρέθενθ'^{1} ὑμᾶς,
ἀλλ' ἐπικνῶσιν τυρόν, ἔλαιον,
σίλφιον, ὄξος, καὶ^{1} τρίψαντες^{1}
κατάχυσμ' ἕτερον γλυκὺ καὶ λιπαρόν,
κἄπειτα^{1} κατεσκέδασαν θερμὸν
τοῦτο καθ' ὑμῶν
αὐτῶν^{1} ὥσπερ^{1} κενεβρείων.^{1}

ΧΟΡΟΣ.

πολὺ δὴ πολὺ δὴ χαλεπωτάτους λόγους
ἤνεγκας, ἄνθρωφ'! ὡς ἐδάκρυσά^{3} γ' ἐμῶν
πατέρων κάκην,^{2} οἳ
τάσδε τὰς τιμάς, προγόνων παραδόντων,
ἐπ'^{1} ἐμοῦ^{1} κατέλυσαν.
σὺ δέ μοι κατὰ δαίμονα καὶ κατὰ συντυχίαν
ἀγαθὴν ἥκεις ἐμοὶ σωτήρ·
ἀναθεὶς γὰρ ἐγώ σοι
τά τε νοττία^{3} κἀμαυτὸν οἰκήσω·
ἀλλ' ὅ τι χρὴ δρᾶν, σὺ δίδασκε παρών· ὡς ζῆν οὐκ ἄξιον ἡμῖν,
εἰ μὴ κομιούμεθα παντὶ τρόπῳ τὴν ἡμετέραν βασιλείαν.

ΠΕΙΣΕΤΑΙΡΟΣ.

καὶ δὴ τοίνυν πρῶτα διδάσκω μίαν ὀρνίθων πόλιν εἶναι,^{1}
κἄπειτα τὸν ἀέρα πάντα κύκλῳ καὶ πᾶν τουτὶ τὸ μεταξὺ^{1}
περιτειχίζειν μεγάλοις πλίνθοις ὀπταῖς ὥσπερ^{1} Βαβυλῶνα,^{3}
κἄπειτ', ἢν τοῦτ' ἐπανεστήκῃ,^{1} τὴν ἀρχὴν τὸν Δί' ἀπαιτεῖν.

II.—1. Explain and illustrate whatever is noticeable in the *construction* of the words or phrases thus numbered.

2. In regard to the words thus numbered, point out whatever is noticeable as to *derivation*, *meaning*, *usage*, or *quantity*.

3. Illustrate the *allusions* involved in the words thus numbered.

4. Name the varieties of versification exemplified in the first nine lines and the next sixteen, and briefly sketch the rules observed by Aristophanes in his treatment of both varieties.

[*Other papers not here reprinted.*]

LATIN.—*Examiner, Rev. Dr. Reichel.*

To be translated into Latin prose:—

The first harangue which the new-comer made in the Senate was so cautiously worded, that no indication whatever of his thoughts could be drawn from it. The coldness of his demeanour before that assembly might raise a fear that he reserved his animation for the forum, and his confidence for the popular demagogues. At the instigation of Piso, Fufius Calenus, one of the tribunes in the interest of Clodius, stepped forward and invited him to address the people in the Flaminian Circus. As soon as he appeared there, Fufius straightway demanded of him whether he approved of the rogation of the consuls by which the judges in the forthcoming trial were to be assigned by the praetor. Pompeius parried the thrust: his answer, as Cicero triumphantly proclaimed, was that of a true aristocrat. He made a laboured speech, with many unmeaning words, in which he magnified the authority and majesty of the Senate, and professed to regard it with the most devoted respect. The consul Messalla was encouraged by this apparent overture to ask his opinion, when he next presented himself in the Senate, on the affair of Clodius and the proceedings of the government. But the crafty dissembler again shrunk within himself; his reply was courteous but indefinite, and was limited to a general approbation of the behaviour of the nobles. He then turned round to Cicero, and expressed a hope that he had said enough on that point. The applause with which even this guarded language was received, induced Crassus to rise and deliver a studied panegyric on the conduct of the late consul. Cicero, sitting next to the object of universal attention, and watching every turn in his countenance, thought that he perceived a gleam of approbation stealing over it. He rose to take advantage of the favourable moment, and enlarged with his usual copious rhetoric on the dangers from which the State had been preserved, and his own share in the glory of the deed. He spoke, as he alone could speak, of the dignity of the senatorial order, the good feeling of the knights, the favourable attitude of the Italians, the paralysis of every element of disaffection, the cheapness of provisions, the security of the commonwealth. The Senate responded to the speaker's entire satisfaction: it was the crowning day of Cicero's vanity: yet one triumph was wanting to it—Pompeius would not be drawn into any farther indication of his views.

Translate:—

I. Nunc cognosce de Salaminiis, quod video tibi etiam novum accidisse tanquam mihi. Nunquam enim ex illo audivi illam pecuniam esse suam. Quin etiam libellum ipsius habeo, in quo est, "Salaminii pecuniam debent M. Scaptio et P. Matinio, familiaribus meis." Eos mihi com-

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Appendix, No. 8.

General Class Examination.

mandat: ascribit etiam et quasi calcar admovet, intercessisse se pro iis magnam pecuniam. Confeceram ut solverent centesimis sexennii ductis cum renovatione singulorum annorum. At Scaptius quaternas postulabat. Metui, si impetrasset, ne tu ipse me amare desineres. Nam ab edicto meo recessissem et civitatem in Catonis et in ipsius Bruti fide locatam meisque beneficiis ornatam funditus perdidissem. Atque hoc tempore impingit mihi epistolam Scaptius Bruti, rem illam suo periculo esse, quod nec mihi unquam Brutus dixerat nec tibi, etiam ut praefecturam Scaptio deferrem. Id vero per te exceperamus, ne negotiatori: quod si cuiquam, huic tamen non. Fuerat enim praefectus Appio, et quidem habuerat turmas equitum, quibus inclusum in curia senatum Salamine obsederat, ut fame senatores quinque morerentur. Itaque ego, quo die provinciam tetigi, quum mihi Cyprii legati Ephesum obviam venissent, litteras misi ut equites ex insula statim decederent. His de causis credo Scaptium iniquius de me aliquid ad Brutum scripsisse. Sed tamen hoc sum animo: si Brutus putabit me quaternas centesimas oportuisse decernere, qui in tota provincia singulas observarem itaque edixissem idque etiam acerbissimis feneratoribus probaretur, si praefecturam negotiatori denegatam queretur, quod ego Torquato nostro in tuo Laenio, Pompeio ipsi in Sex. Statio negavi et iis probavi, si equites deductos moleste feret, accipiam equidem dolorem mihi illum irasci, sed multo majorem non esse eum talem qualem putassem. Illud quidem fatebitur Scaptius, me jus dicente sibi omnem pecuniam ex edicto meo auferendi potestatem fuisse. Addo etiam illud, quod vereor tibi ipsi ut probem: consistere usura debuit, quae in edicto erat meo. Deponere volebant; impetravi a Salaminiis, ut silerent. Veniam illi quidem mihi dederunt; sed quid iis fiet si huc Paullus venerit? Sed totum hoc Bruto dedi, qui de me ad te humanissimas litteras scripsit, ad me autem, etiam quum rogat aliquid, contumaciter, adroganter, ἀκοινωνήτως, solet scribere. Tu autem velim ad eum scribas de his rebus, ut sciam quomodo haec accipiat. Facies enim me certiorem. Atque haec superioribus litteris ad te diligenter perscripseram, sed plane te intelligere volui mihi non excidisse illud, quod tu ad me quibusdam litteris scripsisses, si nihil aliud de hac provincia quam illius benevolentiam deportassem, mihi id satis esse. Sit sane, quoniam tu vis, sed tamen cum eo, credo, quod sine peccato meo fiat. Igitur, ut meo decreto solvatur Scaptio statim, id quam rectum sit tu judicabis, ne ad Catonem quidem provocabo.

II. Sed consultanti super absolutione Asiatici, flens Vitellius, commemorata vetustate amicitiae utque Antoniam principis matrem pariter observavissent, dein percursis Asiatici in rempublicam officiis recentique adversus Britanniam militia, quaeque alia conciliandae misericordiae videbantur, liberum mortis arbitrium ei permisit: et secuta sunt Claudii verba in eandem clementiam. Hortantibus dehinc quibusdam inediam et lenem exitum, remittere beneficium Asiaticus ait: et, usurpatis quibus insueverat exercitationibus, lauto corpore, hilare epulatus, quum se honestius calliditate Tiberii vel impetu C. Caesaris periturum dixisset, quam quod fraude muliebri et impudico Vitellii ore caderet, venas exsolvit, viso tamen ante rogo, jusseque transferri partem in aliam, ne opacitas arborum vapore ignis minueretur. tantum illi securitatis novissimae fuit.

III. Isdem consulibus P. Dolabella censuit spectaculum gladiatorum per omnes annos celebrandum pecunia eorum qui quaesturam adipiscerentur. Apud majores virtutis id praemium fuerat, cunctisque civium, si bonis artibus fiderent, licitum petere magistratus: ac ne aetas quidem distinguebatur, quin prima juventa consulatum et dictaturas inirent. Sed quaestores regibus etiam tum imperantibus instituti sunt: quod lex curiata ostendit ab L. Bruto repetita. Mansitque consulibus potestas deligendi, donec eum quoque honorem populus mandaret. Creatique primum Valerius Potitus et Aemilius Mamercus, sexagesimo tertio anno post Tarquinios exactos, ut rem militarem comitarentur. Dein gliscentibus negotiis duo additi qui Romae curarent. Mox duplicatus numerus, stipendiaria jam Italia et accedentibus provinciarum vectigalibus. Post lege Sullae viginti creati supplendo senatui, cui judicia tradiderat. Et quanquam equites judicia reciperavissent, quaestura tamen ex dignitate candidatorum aut facilitate tribuentium gratuito concedebatur, donec sententia Dolabellae velut venumdaretur.

IV. Novas litterarum formas addidit vulgavitque, comperta Graecam quoque litteraturam non simul coeptam absolutamque.

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1. In what year of the city was Cicero proconsul of Cilicia, and what were the circumstances that led to his being proconsul of Cilicia? Who was his predecessor?

2. Give a sketch of the history of the years which intervene between his return from exile and his proconsulate.

3. Mention the chief events of the reign of Claudius, with dates, where known. What was his full name?

4. Give the dates of the accession to the throne of Tiberius, Caius, Claudius, and Nero, and the date of the death of the last-mentioned Emperor.

5. In what respect did the administration of Claudius chiefly differ from that of Tiberius?

6. What was the idea of the *Principatus* as established by Augustus?

7. Mention the chief steps by which this subsequently went over into the full autocracy of the Emperor. Who first assumed the diadem?

8. The statement respecting the antiquity of the quaestor's office, made by Tacitus in one of the above extracts, seems contradictory to the accounts of other historians. How does Niebuhr reconcile them?

9. Give the respective dates of the introduction of the offices of *consul, praetor, aedilis, quaestor, tribunus plebis, tribunus militum consulari potestate, censor.*

10. When was the office of *praetor peregrinus* instituted? and when did it terminate?

11. Mention peculiarities of the style of Tacitus, specifying particularly idioms which depart from the more correct phraseology of the Augustan age.

12. What was the *Lex Cincia*? How was it modified under Claudius?

13. Define the offence called *praevaricatio*.

14. Tres litteras Claudius adjecit. What were they? What works did Claudius write?

Mathematics.—*Examiner, Professor Tait.*

Coordinate Geometry, &c.

1. Given the coordinates of two points in a plane—find their distance, and the equation to the straight line joining them.

2. Show that the general equation of the first degree represents a straight line. Through how many points is it possible to draw a curve whose equation is of the 2nd, 3rd, ……*n*th degree?

3. Find the length of the perpendicular from a given point upon a given straight line. Apply the expression to find the lengths of the three perpendiculars in the triangle whose sides have the equations

$$x-y=0,\ x+y=0,\ \text{and } 2x+3y=1.$$

4. Give the conditions that the general equation of the second degree may represent a circle. Find the equations to the inscribed and circumscribed circles in the triangle whose sides have the equations $x=0$, $y=b$, $x+y=a$.

5. Interpret the equations

$$\begin{array}{ll} \alpha) & \alpha\beta+\alpha\gamma+\beta\gamma=0 \\ \beta) & \alpha^2+\beta^2-\gamma^2=0 \\ \gamma) & S-k\alpha^2=0 \end{array}$$

where α, β, γ are expressions of the form $x\cos a+y\sin a-p$, and $S=0$ is the equation to a conic.

6. Find the equation to the curve whose radius vector is parallel and equal to the line joining two points in the circumferences of two toothed wheels of different radii, one of which drives the other.

7. Trace the curves whose equations are

$$\begin{array}{ll} \alpha) & a(x+y)^2=(x-y)^3 \\ \beta) & \left(\frac{x}{a}\right)^{\frac{2}{3}}+\left(\frac{y}{b}\right)^{\frac{2}{3}}=1. \end{array}$$

Find the nature of the singular point in (α), and the *whole area* of (β).

Appendix, No. 8.

General Class Examination.

8. Show that the general equation of the first degree in three dimensions represents a plane. Write down the equations to the perpendicular form (a, b, c) upon $ax+by+cz=1$, and find its length.

9. What is the condition that three planes pass through a common line; and what that four planes contain a common point?

10. If $P_1(a_1, b_1, c_1)$, $P_2(a_2, b_2, c_2)$, $P_3(a_3, b_3, c_3)$ lie in a plane which passes through the origin, show that the same is true of $Q_1(a_1, a_2, a_3)$, $Q_2(b_1, b_2, b_3)$, and $Q_3(c_1, c_2, c_3)$.

DIFFERENTIAL CALCULUS, &c.

1. Differentiate the expressions x^3, x^n (n general) and $\log_a x$, deducing the results directly from the definition of a differential coefficient.

2. What properties of algebraic *quantities* are shared by the *symbol* $\frac{d}{dx}$?

Write in their symbolic forms the results

α) $\frac{d^n(\epsilon^{ax}X)}{dx^n}=\epsilon^{ax}\frac{d^nX}{dx^n}+na\epsilon^{ax}\frac{d^{n-1}X}{dx^{n-1}}+$ &c. (n a positive integer).

β) $f(x+h)=f(x)+hf'(x)+\frac{h^2}{1.2}f''(x)+$ &c.

3. Prove generally the formula for the successive differentiation of the product of two functions of one independent variable.

4. What expression satisfies the equation $\left(\frac{d}{dx}+a\right)y=0$?

Integrate by separation of symbols the equations

$$\alpha)\quad \frac{dy}{dx}-ay=x$$

$$\beta)\quad \frac{d^2y}{dx^2}+2a\frac{dy}{dx}+a^2y=\epsilon^{-ax}$$

5. Expand in ascending powers of x the functions $\sin x$, $\log\cos x$, and a value of y from $y^3-xy-1=0$.

6. Given the sum (c) of two lines drawn from a point (a, b) and terminated respectively in the rectangular axes of x and y, find their lengths when the enclosed quadrilateral is a maximum.

7. Find the curve in which the ordinate bisects the angle between the normal and the radius vector.

8. Find the envelop of a straight line which cuts off from rectangular axes segments whose rectangle is constant.

9. Eliminate by differentiation the unknown functions from

$$\alpha)\quad z=\phi\left(\frac{y}{x}\right)$$

$$\text{and } \beta)\quad z=\phi(y+ax)+\psi(y-ax).$$

10. Integrate the differential coefficients

$$\frac{1}{1-x^3},\quad \frac{1}{a\sqrt{x^2+x+1}},\quad \epsilon^{2x}\cos 3x,$$

and $\epsilon^{x}x^{y}\left(y\left(1+\frac{1}{x}\right)+\frac{dy}{dx}(x+\log x)\right)$.

11. Find the form of $\phi(x)$ from the equation

$$\int_0^x \phi(x)dx=\frac{m}{n}x\phi(x).$$

12. Show geometrically or analytically that the least distance between two lines in space is perpendicular to each, and assuming that property find the equations to the least distance between

$$\frac{x-a}{l}=\frac{y-b}{m}=\frac{z-c}{n} \text{ and } \frac{x-a^1}{l^1}=\frac{y-b^1}{m^1}=\frac{z-c^1}{n^1}.$$

SENIOR STUDENTS.

1. Show that if $r^2=x^2+y^2+z^2$ and $r_1^2=a^2x^2+b^2y^2+c^2z^2$,

$$\frac{a^2x^2}{a^2-r^2}+\frac{b^2y^2}{b^2-r^2}+\frac{c^2z^2}{c^2-r^2}=0 \text{ involves}$$

$$\frac{x^2}{b^2c^2-r_1^2}+\frac{y^2}{c^2a^2-r_1^2}+\frac{z}{a^2b^2-r_1^2}=0.$$

2. Prove that

$$\begin{vmatrix} 1 & 1 & 1 \\ \frac{1}{a^2} & \frac{1}{b^2} & \frac{1}{c^2} \\ a^3 & b^3 & c^3 \end{vmatrix}=(a+b)(b+c)(c+a)\begin{vmatrix} 1 & 1 & 1 \\ \frac{1}{a} & \frac{1}{b} & \frac{1}{c} \\ \frac{1}{a^3} & \frac{1}{b^3} & \frac{1}{c^3} \end{vmatrix}$$

3. Find the sum of the rth powers of roots of

$$1-x+x^2=0.$$

4. Find the equation to the surface generated by a straight line which revolves about an axis which is not in the same plane with it.

5. Show that the equations

$$\left.\begin{array}{l} x\xi=a+\omega \\ y\eta=b+\omega \\ z\zeta=c+\omega \end{array}\right\}\qquad \left.\begin{array}{l} x\eta+y\xi=c' \\ x\zeta+z\xi=b' \\ y\zeta+z\eta=a' \end{array}\right\}$$

(where a, b, c, a', b', c' are given) are not consistent unless $a'^2(a+\omega)+b'^2(b+\omega)+c'^2(c+\omega)-4(a+\omega)(b+\omega)(c+\omega)=a'b'c'$; and that, if this condition be satisfied, there is *one* and *only one* real value of ω.

6. The orthogonal trajectories of all conics which can be described about a rectangle whose sides are a and b, have the equation

$$x^{a^2}y^{b^2}=C\epsilon^2(x^2+y^2)$$

7. Find the curve in which the area contained by the ordinate, tangent, and subtangent is a given multiple of that contained by the ordinate, curve, and axes of x and y.

8. Integrate $yp+xq=z$, $\left(p=\frac{dz}{dx},\ q=\frac{dz}{dy}\right)$

$pq=z$,

and $p^2+q^2=1$.

9. Prove that $\Sigma_1^x\frac{4^xx^2}{(x+1)(x+2)}=\frac{2}{3}+\frac{4}{3}\frac{x-1}{x+2}4^x$;

and integrate the equation of differences

$$u_{x+1}-pa^{2x}u_x=qa^{x^2}$$

10. Find the form of the solid of revolution which with given surface contains the greatest volume.

LOGIC.—*Examiner, Rev. Dr. M'Cosh.*

1. Define an abstract notion or term. What are the laws of thought involved in abstraction? Examine the following, "A line is said to have length without breadth; there can be no such line, it is a mere abstraction, a ghost, a nonentity, and all that is demonstrated regarding it can have no objective value."

2. Who is said to be the founder of Conceptualism? Name some eminent Conceptualists. On the supposition that Conceptualism is the right view, state precisely what is meant by Conception? In doing so, criticise the statement that a "general notion is an inadequate notion of an individual." What truths embraced in the Realist doctrine have often been overlooked by Conceptualists?

3. Explain exactly what is meant by the comprehension of a notion as distinguished from the extension? By what process do we arrive at the apprehension of the comprehension of a notion? Show how it is that the comprehension and extension are involved in one another, and are the reverse the one of the other. What does definition bring out in regard to a notion? Can every notion be logically defined? Can you give a complete definition of a general concrete notion? What are the rules of definition.

4 What is meant by contrary, and what by contradictory opposition of terms? Give examples of each. What is meant by contrary, and what by contradictory opposition of propositions? When propositions are in the position of contraries, what can we infer from the one as to the other? When they are contradictories, what can we infer? Give examples.

5. In what special work does Aristotle expound the Syllogism?

(a). Put the following in correct form:—This man since he is a kind man may be regarded as a good man." Say in what Figure it is. Give the special rules of that Figure, and give the reasons of these rules, deriving them from the dictum.

APPENDIX, No. 8.

General Class Examination.

(*b*). Elephants are stronger than horses.
Horses are stronger than men.
Elephants are stronger than men.

Examine the above. What is the predicate of the major premiss? Is there a middle term? Is the reasoning conclusive? Can you put it in syllogistic form?

6. Define a Disjunctive Proposition. What is the nature of a Disjunctive Argument? Of what parts does it consist when it is formally spread out? The argument in behalf of the Gospel narrative is often put in the form of a Disjunctive; can you state it?

7. What is the precise nature of a Dilemma? Put the following in correct form and examine it:— "Honours and rewards by the Government or private patrons are useless, they cannot influence the stupid, and men of genius will rise to eminence without them.

8. Define "Fallacy." Define "Material Fallacy." Mention the principal forms of material fallacies, giving a very brief explanation of each. It is said of Hume, "that without positively asserting much more than can be proven, he gives prominence to all the circumstances which support his case, and glides lightly over those which are unfavourable to it." To what head of fallacies might this method followed by Hume be reduced?

9. Can every truth be proven by argument? Are we at liberty to appeal to intuition or a supposed first truth as we please, or as may suit our purpose? Define "Demonstration." In what sciences is demonstration admissible? Can you give any reason why we should be able to carry it farther in mathematics than in any other science?

10. What is the end of science according to Plato? What is said in modern times to be the end aimed at in science? Wherein did the ancients and the schoolmen err in their view of the proper mode of prosecuting science? On what grounds do you consider it to be needful to proceed by induction in physical science? In what work, and in what part of that work does Bacon unfold his method? Wherein do you consider his method as specially differing from that followed by the ancients and the scholastics?

11. Enumerate the special Means employed in induction. Show wherein precisely experiment has the advantage over mere observation. Experiment is often necessary to enable us to bring a case, under which of the Canons of Induction? On what grounds is it needful or useful to have some sort of hypothesis or conception suited to the case? How does theory differ from hypothesis?

12. Some years ago, certain articles of produce, such as poultry, were much cheaper in Ireland than in such towns as London. or Glasgow, but now the difference is not so great; and the cause of the change is supposed to be steam-boats or railways. According to what Canon is this inference drawn? But what is pre-supposed in order to entitle us to draw this conclusion? Are we, after all, entitled to argue it to be the sole cause? Suppose some one were to refer the change to another cause, what facts might you urge in reply, bringing them under the Joint Method of Agreement and Difference?

13. State the nature of Deduction as distinguished from Induction? In what science is Deduction the all-essential instrument? Is Deduction allowable in physical investigation? What different views have been taken as to whether we may expect most from Induction or Deduction? Specify some physical sciences in which much may now be done by Deduction. Show how the two, Induction and Deduction, may be combined.

14. A geologist finds in the dust only a few bones of a skeleton, and reconstructs the whole animal. On what principles does he proceed? Is there reasoning in the process? If so, indicate how it could be reduced to a syllogistic form.

15. When the Africans beheld Mungo Park's white colour, they alleged that his mother must have steeped him in milk when an infant. Was there reasoning in the process passing through their mind? What was the error in their inference?

For mere *pass*, one or more of the following may be substituted for a corresponding number of the above:—

(*a*). What is meant by relative and correlative terms? Give examples of both.

(*b*). What is the rule as to the distribution of the predicate in affirmative and negative propositions?

(*c*). What is meant by mood? Are the following allowable:—IAI, AIE, AEO, AEI, IEE, III, OAI? When you reject, give reasons.

(*d*). How many Figures are there? Why must the conclusion in the Third Figure be particular?

(*e*). Put the following in correct form, and examine it, indicating the major, minor, and middle terms, and the mood:—"All studies are useful which tend to advance a man in life, or to increase natural and private wealth; but the course of studies pursued at Oxford has no such tendency, therefore it is not useful."

CHEMISTRY.—*Examiner, Dr. Andrews.*

1. Reduce the following degrees of the centigrade scale to the corresponding degrees of Fahrenheit,—10°C,—4°C, + 20°C.

2. Give some account of the methods of obtaining very low temperatures.

3. What is the maximum density point of water, and how is it determined?

4. What is the approximate relation between the sensible and latent heats of steam, and how has this relation been modified by recent experiments?

5. Describe the process of distillation, and state how it may be applied to separate from one another liquids whose boiling points are different?

6. Let V be the volume of a moist gas, T its temperature, and P the pressure to which it is subject in inches of mercury, and let *t* be the tension of aqueous vapour at the temperature T. State the expression for finding the volume V' of the same gas in the dry state, at the same temperature, and under a pressure of 30 inches.

7. State the facts which prove that rock salt is diathermanous to heat from all sources.

8. How is the density of a gas determined?

9. The density of oxygen gas is 1·056, of hydrogen gas 0·0692, deduce from these numbers, and from the volumetric composition of water, the density of its vapour.

10. Give a general account of the method of preparing, and of the leading properties of, the peroxide of hydrogen.

11. Describe the allotropic modifications of sulphur and phosphorus.

12. State some of the relations which exist between chlorine, bromine, and iodine.

13. If sulphur is burned in oxygen gas, the sulphurous acid formed occupies nearly, but not quite, the same volume as the original oxygen, mention another similar example, and state in what cases this apparent deviation from the theory of volumes occurs.

14. How is it proved that the density of the vapour of carbon is 0·415, or some multiple or submultiple of that number?

15. Describe by means of symbols the reaction which occurs when fluoride of silicon (Si Fl_4) comes into contact with water.

16. Give some account of the allotropic forms of boron.

17. Describe the method of obtaining such metals as barium, strontium, calcium, and magnesium, and mention some of their properties.

18. What are the changes which occur in the hardening of mortar? How do hydraulic mortars differ in composition from ordinary mortars?

19. Describe the varieties of sugar, and the changes which occur in the alcoholic fermentation.

20. Give some account of the substitution ammonias.

21. Describe the theory of the Leyden Jar, and explain why sparks are obtained from an insulated jar when its inner and outer surfaces are alternately touched.

22. Give a short account of the chief phenomena of atmospheric electricity.

23. Explain Volta's contact theory, and also the chemical theory of the pile, and mention the arguments which appear to prove the latter to be the true theory.

24. State the law of Ohm.

25. What are the principal facts of diamagnetism?

NATURAL HISTORY.—*Examiner, Dr. Dickie.*

ZOOLOGY.

1. State the general characters of Vertebrata.

2. Mention at least one order in each of the divisions—Archencephala, Gyrencephala, Lissencephala, Lyencephala.

3. Describe the leading peculiarities of the teeth, as to number and structure, in Rodentia and Ruminantia.

4. Describe the general modifications of the skeleton in Aves.

5. State the characters of Ophidia

6. Give reasons for making Amphibia a class distinct from Reptilia.

7. Describe the general plan of an Articulate animal.

8. Give the characters of Myriapoda, and mention any examples of the class.

9. State the characters of Gasteropodous Mollusca

10. Describe the organs of locomotion in Echinida.

BOTANY.

1. State the nature and structure of Papillæ and Hairs

2. State the structure of the Medulla and Medullary Sheath.

3. Mention the opinions respecting the nature of Tendrils.

4. Why are some plants called Dichlamydeous, and others Monochlamydeous? Give examples.

5. Describe the changes of the Pollen after contact with Stigma.

6. State the difference between Cellular and Vascular Cryptogams. Give examples of each.

7. Name any families of plants yielding Silex, Iodine, Bromine.

8. Name the Natural Order having the following characters:—"Leaves alternate, ochreate stipules, perianth more or less persistent, stamens hypogynous, rarely perigynous, ovary one-celled, ovule solitary orthotropous, fruit usually triangular, seed with inverted embryo and farinaceous albumen."

9. State the characters of the Labiatæ, and their general properties. Give examples.

10. Name and describe the accompanying plants.

THIRD YEAR STUDENTS.

NATURAL PHILOSOPHY.—*Examiner, Dr Stevelly.*

PHYSICS.

1. Give the proofs that every body has inertia independent of its weight; and explain why the one property is apt to be confounded with the other.

2. Explain how attraction of the particles of a fluid for each other, and for the material of the tube, will account for both the elevation of some fluids and the depression of others in capillary tubes.

3. Explain what is meant by the stability of a body placed upon a supporting base, and the measure of that stability.

4. Explain the principle and action of the Stanhope combination of levers.

5. Show that in falling bodies $v^2=2gh$, and explain the symbols in this formula.

6. When a rigid body revolves round a fixed axis, show that the velocities of its several particles are proportional to their perpendicular distance from that axis, and define the path of each particle

7. Explain some of the experiments which illustrate the centrifugal endeavour of the parts of a body which revolves round an axis, and show how the force of this centrifugal endeavour may be calculated.

8. Explain what is meant by the permanent axes of rotation of a body; and the distinction between "stable," "unstable," and "neutral" axes.

9. Explain what is meant by a Compensating Pendulum, and give a description of some of the most approved forms of Compensation.

10. Explain what single force is equal to the buoyant pressure of a heavy fluid upon a body totally or partially immersed in it. State its direction, and explain when there is an exact equilibrium between it and the weight of the body. State some of the applications of this principle

11. Show that a heavy fluid, of uniform density, contained in a vessel, flows out of an orifice opened beneath its surface with the velocity that a heavy body would acquire in falling down the perpendicular height of the centre of the orifice below the surface of the fluid.

12. Explain the suspension of the mercury in the barometer tube.

13. Explain what is meant by an image in Optics, and in how many ways images are optically formed.

14. Explain the leading uses of the two essential parts of a telescope.

15. Explain what is meant by the Right Ascension of a body, and how Right Ascensions are observed.

16. Explain how the position of an Astronomical Object is determined, relatively to the Ecliptic, and by what observations the necessary arches are obtained.

GENERAL EXAMINATION for HONORS.

ANALYTIC MECHANICS.

1. Prove that two couples applied to a rigid mass can always be replaced by a single equivalent couple. Explain how it is found and defined.

2. Find the equation of condition that a system of forces applied to rigidly united points may be replaced by a single equivalent force.

3. A force P, acting on a body at the point $x\ y\ z$, whose distance from the origin is r, and which makes the angle a with P, is reduced to a force P at the origin and a couple whose moment is H. Prove that

$$H=r\ P\ \sin a.$$

4. Explain what is meant by "the central axis" of a system of forces applied to the rigidly united points of a body.

5. Prove that the sum of the projections of $L\ M$ and N on the direction of R, has the same value wherever the origin be taken.

6. Find by Guldin's properties the solid content and the area of the ring of an anchor.

7. Find the centre of gravity of a very slender uniform arc of a circle.

8. Investigate the total stretching of a uniform elastic string whose weight is W, suspended by one extremity with the weight W' hanging at its lowest point.

9. Prove that a very slender uniform arch of a circle, whose particles attract as the product of the masses divided by the square of the distance, attracts a particle placed at the centre with the same force as a very slender uniform rod which coincides with the tangents of any two portions into which the arch can be divided touching at the point of division.

10. Find the expression for the square of the resultant acceleration of a particle moving along any curve, and explain what each part of that expression refers to.

11. Show that when a common motion in one given direction is communicated to each of the moving particles of any system, their relative motions are unchanged What important practical result is determinable from this principle?

12. Show that the areas described by the radius vector of a particle moving round a fixed centre to which it is attracted are proportional to the times of describing them.

13. Show how a heavy particle may be made to oscillate in a cycloid, and that the times of its oscillations are equal whether the amplitudes of the oscillations be large or small.

14. Two particles move in circles round central forces, and the squares of their periodic times are as the cubes of their distances. Show that the forces are inversely as the squares of the distances.

Special Prize Examination.

1. Give a summary account of Poisson's proof of the parallelogram of forces.

2. Write down and explain the formulæ by which the magnitude and direction of the resultant of any

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General Class Examination.

number of forces applied to the same point of a body are determined.

3. Explain what is meant by a couple, and how a couple is analytically identified.

4. Prove that a couple acting on any system of rigidly united points may be transferred with the same efficacy to act on the same system in any plane parallel to its own plane, and point out in how many ways its mode of acting in that plane may be varied without altering its effect.

5. Show that any number of couples acting on the same system of rigidly united points must either be in equilibrio or can be reduced to a single equivalent couple.

6. Prove that "the principal moment" of a system of forces applied to the rigidly united points of a body has the same value for every origin assumed along any line parallel to the central axis.

7. Investigate the formulæ by which the co-ordinates of the centre of gravity of a body are given.

8. Find the centre of gravity of a heavy arc of a circle.

9. Investigate the position of that point of a body for which the sum of the products of each of the molecules of which the body is composed, multiplied by the square of its distance from that point, is a minimum.

10. Let v_x, v_y, v_z be the resolved motions of a particle parallel to the co-ordinate axes; find the expression for the motion reduced to a direction which makes the angles λ, μ, ν, with the axis, and prove your assertion.

11. Two bodies move towards each other freely under a force which varies according to any law of distance. Prove that their common centre of gravity is either at rest or moves uniformly in a straight line.

12. Prove that the accelerating force at any instant may be expressed by $\frac{d^2s}{dt^2}$ and point out what units are referred to in the expression.

13. A particle moves in any path under the influence of any accelerating force, deduce the expression for the acceleration along a line which makes the angles λ, μ, ν with the co-ordinate axes.

14. A particle moves round a fixed point, to which it is attracted by a force varying according to any law of distance. Show, by integrating the equations of motion, that its motion is confined to one plane. Find the equation of the plane.

15. The conditions being the same as in the last question, show that the areas swept over by the radii vectores from the fixed point are proportional to the times of describing them, and find the expression for the area swept over in the unit of time.

16. A particle constrained to move in a straight line is acted upon by an accelerating force directed to a fixed point not in that line, and varying as the distance from that point. Determine the motion of that particle.

17. Integrate the differential equation of motion of a particle acted on by a constant force, in one direction, and from the results deduce the leading circumstances of the motion of a body falling freely through small ranges at a given place under the action of gravity; also, of a heavy body projected with a given velocity upwards.

18. Find the velocity which a body descending from rest from an infinite distance, under the influence of a force varying inversely as the square of the distance from a fixed point, would be moving with at any assigned distance from the point; and find the conic section which it would describe if projected laterally with that velocity.

HISTORY AND ENGLISH LITERATURE.

Examiner, Professor Craik.

1. Give an account of Chaucer's Canterbury Tales, in respect of, 1. The date of the work; 2. Its scheme and its extent; 3. The form of the composition; 4. The language; 5. The character of the style; 6. The poetry;—treating the subjects, or as many of them as may be taken up, under so many distinct heads, and in the order in which they are here enumerated.

2. Give an account of the poetical works of Spenser.

3. Write a critical account of any one of Shakespeare's plays.

4. Give an account of any work or volume, in prose or in verse, by any writer of the present century, with which you may be acquainted.

5. Sketch rapidly the history of English Literature throughout the Eighteenth century.

6. Compare the poetical genius of Milton with that of Homer.

7. Sketch the biography of any one of the following writers: Spenser, Shakespeare, Bacon, Milton, Dryden, Pope, Swift, Johnson, Burke, Burns, Scott.

8. Compare or contrast any two of the following writers in respect of poetical genius:—Byron, Scott, Wordsworth, Coleridge, Shelley, Tennyson, Campbell, Crabbe, Moore.

9. Explain the nature of the Artistic.

10. Explain what appears to be the doctrine of Aristotle on the relation of the Poetical (or Artistic) to the True.

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1. Give an account of the succession to the Empire from Charlemagne to the extinction of the Hohenstauffen dynasty.

2. Give an account of the course of succession in the monarchy of France from Clovis to the present day.

3. Give an account of the succession to the sovereignty of the West Saxons, and afterwards of England, from Egbert to the Norman Conquest.

4. Give an account of the succession to the throne of England from the Norman Conquest to the present day.

5. Sketch the course of events in the history of England during any one reign, from that of the Conqueror to that of Richard the Second, inclusive.

6. Sketch the history of Parliamentary Representation in England, from the Conquest to the end of the reign of Edward the Third.

7. Explain the cycles of Meton and Calippus, of the Sun, and of the Indiction, the Julian Period, the Epact, the Dominical Letter, and the Old and New Styles.

8. Discuss the question of a chronology founded simply on the Day.

9. Write a short essay on the study of History as a mental gymnastic.

10. Explain the scheme developed in the lectures of a Universal History, as divided both longitudinally into Periods, and laterally into ramifications or departments.

PHYSICAL GEOGRAPHY.—*Examiner, Dr. Dickie.*

1. State the usual specific gravity of sea water, and mention exceptional localities.

2. Illustrate the climatic influence of ocean currents.

3. State the conditions which determine periodical variations in the amount of water discharged by rivers, and illustrate by examples.

4. Describe the general character of insular and continental climates, and give reasons.

5. State the general contrasts between Isothermals in Northern and Southern Hemispheres, and give reasons.

6. State the nature and cause of Monsoons, and illustrate by a reference to localities.

7. State any Zoological province deficient in Carnivora.

8. Illustrate the influence of temperature upon the dissemination and general distribution of animals.

9. State the Zones where Frugiverous Cheiroptera and Edentata prevail.

10. State the Natural Orders which characterize the Arctic Flora.

METAPHYSICS—*Examiner, Rev. Dr. M'Cosh.*

1. Specify the mental sciences. Define each of them, and show precisely how they differ from each other. How far, and in what sense, do the others depend on Psychology? In which of them is induction, and in

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General Class Examination.

which is deduction, the more important instrument of investigation?

2. What is the ideal theory of sense perception? What various forms has it assumed? For what purposes has it been introduced? What are the objections taken to it?

3. What is the doctrine of natural realism, as opposed to idealism? What are the distinctions employed by the supporters of natural realism in defending their views? Illustrate this subject by the perceptions gained through the eye or any one of the senses?

4. What is involved in the retentive, and what in the recalling power of the mind? On what mental law does the recalling power depend?

5. What is the distinction between the phantasm or mental image, and the abstract or general notion? What are the faculties employed in forming the various kinds of logical notion?

6. Wherein does the conscience resemble the intellectual or cognitive powers—wherein does it differ from them, and wherein is it dependent on them?

7. Show wherein the emotions are dependent on the cognitive or conceptive powers, and wherein they differ from them. In illustrating this subject, take up some one emotion, define it, say to what class it belongs, and show what conception is in it, and what more there is in it.

8. What is the precise function of the Will? Show how the Will may associate itself with the other powers, such as the memory and the conscience.

9. In what relation do the intuitive or primary principles of the mind stand to the faculties? Distinguish between the spontaneous and reflex use of these principles? Under what conditions are we at liberty to appeal to supposed first truths?

10. What function is allotted to the reason by those who distinguish between it and the understanding? Do you think there is such a power? Can there, or can there not, be an *a priori* science?

11. Bring out the leading points involved in our idea of substance? What are the necessary convictions involved in our idea of body?

12. What sort of conviction does the mind seem to have of the infinite? In answering this question, give the views of some eminent philosophers.

13. What is involved in causes? Distinguish between cause and effect on the one hand, and the uniformity of nature on the other. Is a miracle contrary to any intuitive conviction of the mind?

14. Sketch some of the principal theories of beauty? Do there seem to be necessary principles involved in the mind's conviction as to beauty?

15. Who have been the principal defenders of the utilitarian theory of virtue? State and examine the "greatest happiness principle."

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1. What is the meaning and what the origin of the word Metaphysics? What Pre-Socratic sect discussed metaphysical topics? Under what name are Metaphysics treated of by Plato? What does Bacon allot to Metaphysics? What is its field according to Descartes? What according to the German metaphysicians who succeeded Kant? What is its field according to the Lectures in the Class?

2. What are Hobbes' views as to the intelligence and the will? What are man's natural rights according to him? How can these be limited? In sketching his doctrines, you are invited to point out their defects.

3. Name the principal philosophical works of Descartes. What was his argument in behalf of the Divine existence? Do you know of any others who have employed a similar argument?

4. In what age did Leibnitz live? Give as clear an account as you can of his theory of monads. What distinctions does he draw as to perceptions?

5. What is the date of Locke's Essay? How many books does it contain? What are the faculties employed according to Locke in working on the materials derived from sensation and reflection? What is the function allotted to intuition?

6. In what points does Locke differ from Condillac and the Sensational School of France?

7. What is the distinction drawn between the logical and chronological order of our ideas? Examine it.

8. What view did Samuel Clarke take of space and time? How did he argue from them as to the existence of God? Examine his argument.

9. What, precisely, is Berkeley's doctrine as to Ideas? How did he stand in this respect in reference to Locke? What is his precise doctrine as to the existence of Matter?

10. Name the principal works of Reid? What were the topics chiefly discussed by him, and in opposition to whom? What is his account of perception? Wherein does that of Brown differ? Wherein do Hamilton and he agree, and wherein do they differ as to perception?

11. What are the ideas of Pure Reason according to Kant? What objective value have they? How does Kant save himself from scepticism? Is his method satisfactory?

12. What are the views of Price and of Brown as to the psychological nature of the moral power?

13. Who were the precursors of Cousin in the reaction against the Sensational School? To what schools of philosophy has he looked in devising his own system? How does he effect a passage from psychology to ontology? In answering this question you are expected to define ontology, and say whether you reckon Cousin's method on this subject satisfactory.

14. What are the philosophical works of Hamilton? He says that the necessity attached to the principles of common sense "is of two kinds."

POLITICAL ECONOMY AND JURISPRUDENCE.

Examiner, Professor Leslie.

1. Enumerate the causes on which the productiveness of Labour chiefly depends.

2. State and prove Mr. Senior's "Fourth Elementary Proposition."

3. Enumerate the chief advantages arising from the division of Labour.

4. What are the causes which regulate the prices of manufactured commodities produced under circumstances of free competition, and of agricultural produce, respectively, and why?

5. State the probable effects of a great increase of demand upon the prices of manufactured and raw materials, respectively.

6. Explain the different effects of taxation upon the prices of manufactured and raw produce, respectively.

7. Enumerate the principal circumstances which occasion variations in the wages and profits of different employments.

8. What are the causes which regulate the average rate of wages?

9. What are the causes which regulate the average rate of profit?

10. What is the Mint price of an ounce of Gold; and why is it so much, and neither more nor less?

11. Define the terms Money, Bank-Notes, a Pound Sterling.

12. Explain the principles of the Bank Charter Act of 1844.

13. All the main questions in political Science are reducible to two branches of inquiry?

14. What are the primary divisions of Law?

15. What are, according to Bentham, the four conditions of a complete code?

16. What changes took place, in the reign of William the Conqueror, in English Law and Judicial Organization?

17. How did the separate systems of Law and Equity in England originate?

18. State the principal arguments for and against trial by Jury.

APPENDIX, No. 8.

General Class Examination.

Special Prize Examination.

POLITICAL ECONOMY.

1. Explain the manner in which the rate of wages is affected by—
   - (*a*) The amount and kind of national capital engaged in production.
   - (*b*) The mode of expenditure of the national income.

2. Analyze the causes which regulate the rate of profit.

3. Prove that a demand for commodities is not equivalent to a demand for labour; and also that all capital does not constitute a demand for labour.

4. Mr. Senior's treatise contains propositions inconsistent with both the foregoing?

5. Upon what causes will the amount of land-rent in Great Britain, and in the United States, at the end of the present century depend?

6. Why does an apprehension of War occasion a fall in the price of the Funds?

7. What effect would an immediate and total repeal of protective duties in Europe and America, produce in half a century upon—
   - (*a*) The price of Manufactures?
   - (*b*) The price of Food?
   - (*c*) The rate of Wages, estimated in money, in food, and in manufactured commodities, respectively?

8. Upon whom do the losses by shipwreck of insured vessels engaged in trade fall?

9. Explain the principle of the Bank Charter Act of 1844.

10. Explain the causes which determine the natural amount of the Currency.

11. Would the rate of wages be affected by a heavy tax on profits in all employments, or would the whole burden fall upon Capitalists?

12. State the principal objections to indirect taxation.

POLITICAL PHILOSOPHY.

1. Define the following terms:—
   - (*a*) Jurisprudence.
   - (*b*) Ethics.
   - (*c*) Science of Politics.
   - (*d*) Science of Society.
   - (*e*) Law.
   - (*f*) Political and Civil Liberty.

2. Explain and refute the theory which traces the origin of Political Society to a primitive compact, including in your answer the names of its principal advocates, chronologically stated.

3. What is Lord Brougham's theory respecting the foundation of the Right of Property?

4. What are the four essential conditions of a good code according to Bentham?

5. What are the Sanctions of Natural Law, and of Positive Law, respectively?

6. Explain the following maxims of Lord Bacon:—
   - (*a*) Consequentiæ non est consequentia.
   - (*b*) Exceptio firmat vim legis.
   - (*c*) Optima est lex, quæ minimum relinquit arbitrio Judicis; optimus Judex qui minimum sibi.

[The candidate is at liberty to answer, instead of the six preceding questions, the following, but he must elect between the one set of questions and the other.]

POLITICAL ECONOMY.

1. Trace the incidence of a tax on houses.

2. State the effect on rent of—
   - (*a*) An ad valorem tax on agricultural produce;
   - (*b*) A tax of so much per cultivated acre;
   - (*c*) A tax on wages and profits.

3. "The incidence of Taxes on Wages is very different according as the wages taxed are those of ordinary unskilled labour, or of skilled labour." (Mill's Elements of Political Economy.) State the grounds upon which Mr. Mill rests this position, and show that he has overlooked an important consideration.

4. Explain the following terms:—
   - (*a*) The par of Exchange (between the currencies of different countries);
   - (*b*) The Nominal par;
   - (*c*) The Real par;
   - (*d*) The Original par.

5. (*a*) What are the causes of the transmission of bullion from one country to another?
   - (*b*) When is the Exchange between two countries at par?
   - (*c*) What is the limit to the premium on Foreign Bills of Exchange, and why?
   - (*d*) What is the effect upon the exportation and importation of commodities of an unfavourable rate of the Real and Nominal Exchange respectively.

6. "The quotation of Gold at Paris is about $1\frac{1}{2}$ per mille discount, and the Short Exchange on London is 25·10 per £1 sterling. On comparing these rates with the English Mint Price of £3 17s $10\frac{1}{2}d.$ per oz. for Standard Gold, it appears that Gold is about $\frac{1}{10}$ per cent dearer in Paris than in London. Explain this.

FIRST YEAR ENGINEERING STUDENTS.

MINERALOGY AND GEOLOGY.—*Examiner, Dr. Wyville Thompson.*

1. Name the principal (*a*) Felspathic Lavas, (*b*) Felspathic Traps, (*c*) Dolerites, and (*d*) Hornblendic Traps, giving their lithological characters.

2. What are the principal modifications in the structure, and in the mode of occurrence of the Sedimentary Rocks; which have been produced by metamorphic action?

3. In which formations in this country, and on the Continent, is rock salt usually found, and with what other minerals is it frequently associated?

4. In which formation have the earliest remains of Mammalia been discovered, and to which mammalian order have these remains been referred?

5. Give the characters of the orders of the class *Echinodermata*. At which period does each order attain its maximum development? Through what modifications in structure does each order pass, as we ascend from the older to the more recent formations?

6. *Bakevellia antiqua. [illegible]. Marsupites ornatus. Belemnitella mucronata. Terebratula numismalis. Actinocrinus amphora. Holoptychius Andersoni. Trinucleus concentricus.* Refer the above fossils to their Zoological position, and state the geological formations of which they are severally characteristic.

7. What are the optical properties of *Tourmaline?*

8. What is Mohs' "scale of hardness."

SURVEYING AND MAPPING.—*Examiner, Professor James Thomson, A.M., C.E.*

1. Taking the influence of the earth's diurnal rotation into account, explain how it is that an incorrect idea is given by defining, as is often done, points at the same level as being those which are equally distant from the earth's centre; and give a correct definition of the art of levelling.

2. Explain the nature of the indications of the levelling instrument, showing how they correspond with a correct definition of the art of levelling.

3. Considering the earth as a globe 7,916 miles in diameter, explain the ordinary method of finding approximately the correction for curvature of the earth to be made on the indications of the levelling instrument. Also calculate the correction requisite for curvature when the length of sight is 22 chains. Also give a simple rule for determining the correction for curvature in feet when the distance is given in miles.

4. Explain why it is that, in respect to sights taken with the levelling instrument, the usual practice of diminishing the correction for curvature by about $\frac{1}{7}$ of itself, as a further correction for refraction, is erroneous in principle; and that, for sights of any ordinary lengths, no such correction ought to be made.

APPENDIX.
No. 8.

General Class Examination.

5. Make the proper entries in the columns of rise and fall, and reduced levels, in the following portion* of a field levelling book, and give the proper checks on the accuracy of the arithmetical work.

6. Find in acres, roods, and perches, the area of the principal quadrilateral shown in the accompanying leaf of a field book* giving the details of the work. In this, take the quadrilateral as divided into two triangles by the diagonal.

7. Using the calculations of the foregoing exercise, find farther the area in acres, roods, and perches, of the entire plot of land shown surveyed in the same leaf of a field book.

8. As a check on the accuracy of the survey and of the calculations for the area of the quadrilateral, find that area by calculating the areas of the four principal triangles and taking their sum.

9. Give the readings of the verniers of the horizontal limb of the theodolite before you, for the position at which the limb is clamped.

10. What is the test by which to ascertain that the line of collimation in a theodolite is in adjustment?

11. If, with a theodolite, on ground between two stations, both visible from that place, but inaccessible, you wish to range a straight line which will form part of the line joining the two stations, how may you proceed to place the theodolite exactly in the straight line between the two stations?

ELEMENTARY MECHANICAL DRAWING.—*Examiner, Mr. Hale.*

The examination comprised questions proposed at the general examination at the end of the course, and also a scrutiny of drawings executed during the session.

SECOND YEAR ENGINEERING STUDENTS.

PRACTICAL MECHANICS.—*Examiner, Dr Stevelly.*

1. From what depth will an engine of 6 horses' effective power be capable of raising 4·8 tons of ore per hour?

2. What effective horse-power of engine will be required to supply 12,000 families each with 40 gallons of water per day, raised to a mean height of 90 feet, the engine to work 10 hours each day?

3. What is the horse-power of an engine capable of pumping water from three different levels in a mine—one of 40 fathoms, a second of 65, and a third of 85 fathoms depth. The pump from the first delivering 20 cubic feet of water per minute, that from the second 10, and that from the third 30 cubic feet per minute?

4. Show that the total number of foot pounds of work performed in moving a heavy body up a rough inclined surface, by a force acting parallel to the surface, is equal to the work performed against friction on the horizontal projection of the same surface, added to the number of foot pounds expended in raising the weight against gravity up the vertical projection.

5. What must be the horse-power of a locomotive engine which is capable of moving a train weighing 50 tons, on a level rail, at the steady speed of 30 miles an hour, the resistance of the air to the motion of that train. at 10 miles per hour, having been found to be 33lbs.?

6. Compare this with the horse power used in overcoming the friction of the rail alone, neglecting the resistance of the air.

7. In calculating the power of steam worked expansively, or in using the curves furnished by the indicator, a rule given by Thomas Simpson for finding the area of curves is much used. Give that rule, and show that it affords a near approximation to the true area.

8. The safety-valve of a steam engine exposes three square inches of surface to the steam; it weighs 4lbs., and its pin is pressed by a lever of the second order, a rod of 20 inches long, which weighs 4lbs., the pin being two inches from the fulcrum; at what elastic force will the steam open this valve and blow off?

9. What weight hanging at the extremity of the lever would insure the steam not to blow off till it acquired an elastic force of 58lbs. above atmospheric tension?

10. What is the velocity ratio of two curved pieces which act by immediate contact? Prove your assertion, and show what link connecting pieces turning round the same centres would at that instant have the same effect.

11. Wheels require to be placed on parallel axes at a given distance which shall produce a required angular velocity ratio. Show how the pitch circles are formed. Also, show how the curves for teeth to be cut on those, which shall be the involutes of circles, are found.

12. Bevel wheels require to be placed on two given axes, which, if produced, would meet at a given point, and which are to produce a given velocity ratio: find the radii of two pitch circles that will answer for these, and determine the positions on the axes at which they are to be fixed.

[The Second Year Engineering Students were examined in Natural Philosophy and Experimental Physics with the Arts Students of the Third Year.]

CIVIL ENGINEERING.—*Examiner, Professor James Thomson,* A.M., C.E.

1. State some of the principal matters which a specification ought generally to contain.

2. What is the nature and use of the *Schedule of Prices* commonly appended to a specification?

3. Describe briefly, without a diagram, how, in Descriptive Geometry, the point of intersection of three planes may be found, the planes being given by their traces

4. In Descriptive Geometry, given two straight lines by their projections, it is required to find the traces of the plane which passes through one of them, and is parallel to the other.

5. Describe the principal qualities and distinctions of Granite, Gneiss, and Syenite, considered as building materials.

6. What are the chief distinctions between rich limes and hydraulic limes, in respect to their composition and to the qualities of the mortars made from them?

7. Describe the natural material from which Roman cement is commonly made.

8. Describe the process by which strong cements, such as Portland cement, are made from materials artificially mixed together.

9. Describe the chief precautions which ought to be taken in the deposition of beton in a trench for the formation of a good subaqueous foundation without the removal of the water.

10. What is meant by an Order in Grecian and Roman architecture?

11. Name the five Orders of architecture, distinguishing between the Grecian and the Roman Orders.

12. What is the distinction between the Corinthian and Composite orders?

13. Give sketches of the eight regular mouldings of Classical Architecture, with their names.

14. State what part of a capital is termed the Abacus: and give sketches of the *bell shaped* and *bud* capitals of Egyptian architecture, showing the Abacus as formed in them.

15. In an oblique bridge designed on the principles prescribed by Buck—

(*a*). What is the nature of the curved surface of the coursing bed, and how must straight lines be placed if they are to coincide with that surface?

(*b*). Describe the nature and mode of application of the "*Twisting Rules*" with which the mason ought to be supplied, in order that he may be enabled to cut the coursing beds to the proper forms.

(*c*). What is meant by the "*angle of the skewback of the intrado or soffit?*"

(*d*). Explain the method of determining by geometrical construction the angle of the skewback of the intrado for a segmental oblique arch.

(*e*). What is the angle at which the coursing joints and the heading joints ought approximately to cross

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* Printed for the Examination, but not here reprinted.

APPENDIX,
No. 8.

General Class Examination.

one another in the intrado, and how does the angle of their crossing in the extrado differ from that of their crossing in the intrado?

16. Give a correct definition of the *modulus of elasticity* for elongation and for linear compression, and state whether or not the modulus is usually regarded as being the same for both.

17. Explain the principal true cause of the sets found by Hodgkinson to occur in bodies subjected to loads very light in comparison to what they can permanently and repeatedly resist; and show the bearing of the phenomenon in question on the maxim of loading bodies within their elastic limits.

18. If a beam 9 ins. square in cross section, be made up of three planks, each 9 ins. × 3 ins., bound slightly together, and be used for resisting transverse strain, being supported at both ends, and loaded at the middle, what will be the ratio of its strength, and what the ratio of its stiffness in two cases, in one of which the planks are set on edge, and in the other set lying flat; the consideration of cohesion or friction between the surfaces of contact being neglected as unimportant?

19. Give the investigation to find the moment of inertia of the cross section of a rectangular beam round its neutral line considered as passing through the centre of gravity of the cross section, and as being parallel to the top or bottom of the beam.

20. A beam uniform in cross section throughout its length is supported at both ends, and bears 10 tons applied at the middle. What is the greatest load uniformly spread over its length that it can bear without suffering a greater strain at the middle?

21. In the side of a tubular bridge consider a portion of the plate one foot square, having two sides vertical and the other two level. Let it be taken at the neutral lamina of the side of the bridge, so that it may be regarded as sensibly free from tensile or compressive strains in the direction of the bridge, but as having a horizontal shearing strain passing through the neutral lamina, and through all other horizontal sections. State, under these circumstances, what is the nature of the shearing strains communicated through all vertical cross sections of the plate; and state what tensile and what compressive forces are communicated in the directions of the diagonals of the square, and may in combination be looked on as identical with, or may be substituted for, the two sets of shearing strains.

22. Give explanations of the reasons of the answers to the foregoing exercise.

23. Explain how and why it is that a long uniform pillar with its ends firmly fixed has the same power to resist breaking as a pillar of the same diameter, and half as long with the ends rounded.

24. Give a definition or description of the art of Geometrical or Linear Perspective, showing the essential relation which must subsist between the positions of the eye, the picture surface, the objects represented, and their representations.

25. Taking the picture surface as a vertical plane, state, with explanations, how to represent—

1st—All vertical straight lines;

2nd—All horizontal straight lines parallel to the picture plane; and,

3rd—All straight lines in general which are parallel to the picture plane.

26. What is meant by the vanishing point of a straight line?

27. Show that all parallel original straight lines have the same vanishing point.

28. What is the radial of an original straight line, and how is it used for determinating the vanishing point of that line?

FACULTY OF MEDICINE.

FRENCH.—*Examiner, Dr. Frings.*

A côté des phénomènes de la vie externe, plaçons maintenant ceux de la vie organique; nous verrons que l'harmonie n'a sur eux aucune influence. Qu'un rein plus fort que l'autre sépare plus d'urine; qu'un poumon mieux développé admette, dans un temps donné, plus de sang veineux et renvoie plus de sang artériel; que moins de force organique distingue les glandes salivaires gauches d'avec les droites, qu'importe? la fonction unique à laquelle concourt chaque paire d'organes n'est pas moins régulièrement exercée. Qu'un égorgement léger occupe l'un des côtés du foie, de la rate, du pancréas, la portion saine supplée, et la fonction n'est pas troublée. La circulation reste la même au milieu des variétés fréquentes du système vasculaire des deux côtés du corps, soit que ces variétés existent naturellement, soit qu'elles tiennent à quelques oblitérations artificielles de gros vaisseaux, comme dans l'anévrisme.—BICHAT

The heart in man is a double organ; that is, it consists of two complete and distinct organs, united together into one mass, but performing their functions without interference or connexion. These two parts are called the right and left sides of the heart, and each has two distinct cavities, called auricles and ventricles. The right side of the heart receives the blood from the body at large, and sends it to the lungs; the left receives it from the lungs and sends it to the body. The heart is of a conical shape, is situated in the thorax, just within the sternum, a little inclining to the left side, so that it touches the ribs at the spot where the beating is felt, and hence it has usually been supposed to be on the left side. The main body of the heart is composed of the two ventricles, which are strong muscular cavities—the left far more so than the right: the auricles are situated around the base of the organ, seeming rather to be loose appendages than constituent parts of it.

MATERIA MEDICA.—*Examiner, Dr. J. Seaton Reid.*

1. Define the meaning of an alterative medicine.

2. Name the two alteratives in most general use.

3. Mention the preparations of each you would use as alteratives, and write a prescription for each.

4. For what diseases are alteratives generally prescribed? How long are they usually continued, and what effects of each of your medicines would you watch for, in order to guide you in continuing or diminishing their use?

5. State the directions you would give to a patient under an alterative course, respecting diet, clothing, and exercise.

6. State Mialhe's views respecting the means by which calomel is rendered capable of being absorbed.

7. State Dr. Headland's views on the same question, and the experiments on which they were based.

8. Why is acetas plumbi preferred to sulphas aluminis et potassæ in hæmoptysis? Write a prescription for a mixture containing it.

9. Name the medicines on the table. Classify them therapeutically, and write a prescription for each, containing three, if not four, of the usual components of a regular prescription.

10. Indicate in all the prescriptions which article is the base, the adjuvant, &c.

MEDICAL JURISPRUDENCE.—*Examiner, Dr. Hodges.*

1. State the symptoms of poisoning by Aconite, and the treatment to be adopted.

2. Give an account of the chemical means to be adopted for the detection of Alcohol.

3. What is the treatment required in cases of poisoning by Opium?

4. How is Phosphorus to be detected in the stomach?

5. How are blood-stains identified?

6. By what means is the presence of Brains, Chalk, and Starch, in Milk discovered?

FACULTY OF LAW.

JURISPRUDENCE.—*Examiner, Professor Leslie.*

1. Why is a share in the judicial power of more importance to a people in the early stages of civilization, than a participation in the power of legislation?

General Class Examination.

2. What Anglo-Saxon tribunals survived the Conquest? and what new ones were introduced in the Anglo-Norman reigns?

3. Trace briefly the history of trial by Jury.

4. When were itinerant Justices of Assize first regularly established, and with what effects upon English Common Law?

5. How was the descent of lands regulated :—
   - (*a*) Before the Conquest?
   - (*b*) In the age of Henry I.?
   - (*c*) In the age of Henry II.?

6. Write a short history of the principal changes which the English Law of Evidence has undergone.

7. Trace the principal changes in English Law since the reign of Edward I. respecting the freedom of aliening lands inter vivos.

8. Trace the principal changes which the Law of England has undergone since the Conquest, in respect of the right of devising lands.

9. What were the sources of the Feudal Law?

10. What were the sources of the Canon Law?

11. Define Positive Law, Natural Law, International Law, Jus Gentium, Jus Privatum.

12. State the doctrines of Locke, Paley, and Brougham, respectively, relating to the foundation of the Right of Property.

MATRICULATION EXAMINATION.—OCTOBER, 1859.

Matriculation Examination.

MATHEMATICS.—*Examiner, Professor Tait.*

ARITHMETIC.

1. Give in the simplest forms the values of

$$1-\frac{1}{3}+\frac{3}{5}-\frac{5}{7} \text{ and } \frac{1}{2}+\cfrac{\frac{1}{3}}{\cfrac{1}{4+\frac{1}{3}}}$$

2. To how many decimal places do $\left(\frac{\sqrt{29}+1}{14}\right)$ and $\left(\frac{3640}{7981}\right)$ correspond?

3. Find the value of $18901\times215191-98145\times41442$; and calculate

$$1+\frac{1}{2}+\frac{1}{2\times3}+\frac{1}{2\times3\times4}+\frac{1}{2\times3\times4\times5}+\text{\&c. to 6 decimal places.}$$

4. If three men in 5 days can build 700 cubic feet of brickwork, what length of brick wall $1\frac{1}{2}$ feet thick and $7\frac{1}{2}$ feet high, can be built in 13 days by 29 men.

5. If income-tax be $7\frac{1}{4}d.$ in the pound on incomes above £100, what does a man lose per annum by having his salary raised from £99 to £101?

ALGEBRA.

1. If $a=2$, $b=3$, $c=4$, $d=5$, find the numerical values of

$$\sqrt[3]{a^2+c},\ \sqrt{\frac{b^3+d}{ac}} \text{ and } \sqrt{\frac{c(d+1)+ab-bc}{\sqrt[3]{ac}}}, \text{ and}$$

show that $(ab-cd)^2-(ac-bd)^2=b(2c-1)(a+d)$.

2. Multiply together $(a-b+c)$ and $(a-c+b)$, and divide $x^{10}-a^{10}$ by a^2-x^2.

3. Reduce to their simplest forms the expressions

$$x(cz-dy)+y(dx-bz)+z(by-cx)$$

$$\text{and } \frac{c}{b}\left(\frac{a^2-b^2}{a^2-c^2}\right)+\frac{a}{b}\left(\frac{b^2-c^2}{a^2-c^2}\right)-1.$$

4. Extract the square root of

$$1+\frac{25}{4}x^4-15x^3-6x+14x^2.$$

5. Solve the simple equations

$$\alpha)\quad 5x+3=12+2x.$$

$$\beta)\quad \frac{1}{x}-\frac{1}{2}=\frac{1}{3x}+\frac{1}{4}$$

$$\gamma)\quad \frac{1}{x-a}-\frac{1}{x-b}=\frac{1}{x-b}-\frac{1}{x-c}$$

and find the actual value of each member of the latter.

SCHOLARSHIP EXAMINATIONS.—OCTOBER, 1859.

Scholarship Examinations

LITERARY SCHOLARSHIPS.

FIRST YEAR STUDENTS.

GREEK.—*Examiner, Professor MacDouall.*

I.—Translate perspicuously the following extracts :—

1. From the second book of the *Ilias* :

“ὦ πόποι! ἦ δὴ παισὶν ἐοικότες[1] ἀγοράασθε[2]
νηπιάχοις,[36] οἷς οὔ τι μέλει πολεμήϊα ἔργα.
πῇ δὴ συνθεσίαι[37] τε καὶ ὅρκια βήσεται[4] ἡμῖν;
ἐν πυρὶ δὴ βουλαί τε γενοίατο[5] μήδεά τ’ ἀνδρῶν
σπονδαί[39] τ’ ἄκρητοι[38] καὶ δεξιαί, ᾗς ἐπέπιθμεν![6]
αὔτως[40] γὰρ ῥ’ ἐπέεσσ’ ἐριδαίνομεν, οὐδέ τι μῆχος
εὑρέμεναι δυνάμεσθα, πολὺν χρόνον ἐνθάδ’ ἐόντες.
Ἀτρεΐδη! σὺ δ’ ἔθ’, ὡς πρίν, ἔχων ἀστεμφέα[41] βουλὴν
ἄρχευ’ Ἀργείοισι κατὰ κρατερὰς ὑσμίνας·
τούσδε δ’ ἔα φθινύθειν,[7] ἕνα καὶ δύο, τοί κεν Ἀχαιῶν
νόσφιν βουλεύωσ’—ἄνυσις δ’ οὐκ ἔσσεται αὐτῶν—
πρὶν Ἄργοσδ’ ἰέναι, πρὶν καὶ Διὸς αἰγιόχοιο[42]
γνώμεναι[8] εἴτε ψεῦδος ὑπόσχεσις,[43] ἦε καὶ οὐκί.
εἰ δέ τις ἐκπάγλως[44] ἐθέλει οἶκόνδε νέεσθαι,
ἁπτέσθω ἧς νηὸς ἐϋσσέλμοιο[45] μελαίνης,
ὄφρα πρόσθ’ ἄλλων θάνατον καὶ πότμον ἐπίσπῃ.[9]
ἀλλά, ἄναξ! αὐτός τ’ εὖ μήδεο[10] πείθεό τ’ ἄλλῳ·
οὔ τοι ἀπόβλητον ἔπος ἔσσεται, ὅττι κεν εἴπω.[11]
κρῖν’ ἄνδρας κατὰ φῦλα[46] κατὰ φρήτρας τ’,[47] Ἀγάμεμνον!
ὡς φρήτρη φρήτρηφιν[12] ἀρήγῃ,[13] φῦλα δὲ φύλοις.
εἰ δέ κεν ὣς ἔρξῃς[14] καί τοι πείθωνται Ἀχαιοί,
γνώσῃ ἔπειθ’, ὅς θ’ ἡγεμόνων κακός, ὅς τέ νυ λαῶν,
ἠδ’ ὅς κ’ ἐσθλὸς ἔῃσι·[15] κατὰ σφέας γὰρ μαχέονται·[16]
γνώσεαι[17] δ’, εἰ καὶ θεσπεσίῃ[18] πόλιν οὐκ ἀλαπάξεις
ἦ ἀνδρῶν κακότητι καὶ ἀφραδίῃ[10] πολέμοιο.”

2. From the *Medeia* of EURIPIDES :

ΧΟΡΟΣ.

Ἔρωτες ὑπὲρ μὲν ἄγαν ἐλθόντες οὐκ εὐδοξίαν — στρ. α΄.
οὐδ’ ἀρετὰν παρέδωκαν ἀνδράσιν· εἰ δ’ ἅλις ἔλθοι
Κύπρις, οὐκ ἄλλα θεὸς εὔχαρις οὕτω.
μήποτ’, ὦ δέσποιν’! ἐπ’ ἐμοὶ χρυσέων τόξων ἐφείης[18]
ἱμέρῳ χρίσασ’[19] ἄφυκτον οἰστόν!
στέργοι δέ με σωφροσύνα, δώρημα κάλλιστον θεῶν! — ἀντιστρ. α΄.
μηδέ ποτ’ ἀμφιλόγους ὀργὰς ἀκόρεστά[30] τε νείκη,
θυμὸν ἐκπλήξασ’[20] ἑτέροις ἐπὶ λέκτροις,
προσβάλοι[21] δεινὰ Κύπρις, ἀπτολέμους δ’ εὐνὰς σεβίζουσ’
ὀξύφρων κρίνοι λέχη γυναικῶν!
ὦ πατρίς! ὦ δῶμά τ’ ἐμόν! — στρ. β΄.
μὴ δῆτ’ ἄπολις γενοίμαν[22]
τὸν ἀμαχανίας[11] ἔχουσα δυσπέρατον[23] αἰῶν’
οἰκτροτάτων ἀχέων!
θανάτῳ θανάτῳ πάρος δαμείην[23]
ἁμέραν τάνδ’ ἐξανύσουσα![24] μόχθων δ’ οὐκ
ἄλλας ὕπερθεν ἢ γᾶς πατρίας στέρεσθαι.[25]
εἴδομεν,[26] οὐκ ἐξ ἑτέρων — ἀντιστρ. β΄.
μύθων ἔχομεν φράσασθαι·[27]
σὲ γὰρ οὐ πόλις, οὐ φίλων τις ᾤκτισεν[28] παθοῦσαν[29]
δεινότατον παθέων.
ἀχάριστος ὄλοιθ’[30] ὅτῳ[31] πάρεστι
μὴ φίλους τιμᾶν[32] καθαρᾶν[33] ἀνοίξαντα[34]
κλῇδα[35] φρενῶν! ἐμοὶ μὲν φίλος οὔποτ’ ἔσται.

II. 1. 1-35. Parse accurately all the words thus numbered. You will conjugate fully every verb, giving no tense-forms which are not actually used by Classical authorities, but substituting for such as are wanting those which are used as their equivalents. You will also discriminate in this respect Homeric usage from Attic.

Appendix, No. 8.

Scholarship Examinations

2. 35-48. Derive or decompound each of the words thus numbered, explaining peculiarities of formation, and collating with such as are exclusively Epic or Poetic the forms which they have assumed, or the equivalents which are used for them, in Attic.

3. Elucidate such constructions or idioms in either extract as may seem to invite special remark.

4. State the leading principles of Homeric versification.

I.—Translate accurately the following passages:—

1. From Xenophon, *Anabasis*, IV, 5.

ἐνταῦθά τινες ἀπώλοντο τῶν στρατιωτῶν. ἐφείποντο δὲ τῶν πολεμίων συνειλεγμένοι τινὲς καὶ τὰ μὴ δυνάμενα τῶν ὑποζυγίων ἥρπαζον καὶ ἀλλήλοις ἐμάχοντο περὶ αὐτῶν. ἐλείποντο δὲ καὶ τῶν στρατιωτῶν οἵ τε διεφθαρμένοι ὑπὸ τῆς χιόνος τοὺς ὀφθαλμοὺς οἵ τε ὑπὸ τοῦ ψύχους τοὺς δακτύλους τῶν ποδῶν ἀποσεσηπότες· ἦν δὲ τοῖς μὲν ὀφθαλμοῖς ἐπικούρημα τῆς χιόνος, εἴ τις μέλαν τι ἔχων πρὸ τῶν ὀφθαλμῶν πορεύοιτο, τῶν δὲ ποδῶν, εἴ τις κινοῖτο καὶ μηδέποτε ἡσυχίαν ἔχοι καὶ εἰς τὴν νύκτα ὑπολύοιτο· ὅσοι δὲ ὑποδεδεμένοι ἐκοιμῶντο, εἰσεδύοντο εἰς τοὺς πόδας οἱ ἱμάντες καὶ τὰ ὑποδήματα περιεπήγνυντο· καὶ γὰρ ἦσαν, ἐπειδὴ ἐπέλιπε τὰ ἀρχαῖα ὑποδήματα, καρβάτιναι πεποιημέναι ἐκ τῶν νεοδάρτων βοῶν. διὰ τὰς τοιαύτας οὖν ἀνάγκας ὑπελείποντό τινες τῶν στρατιωτῶν· καὶ ἰδόντες μέλαν τι χωρίον διὰ τὸ ἐκλελοιπέναι αὐτόθι τὴν χιόνα εἴκαζον τετηκέναι· καὶ τετήκει διὰ κρήνην τινά, ἣ πλησίον ἦν ἀτμίζουσα ἐν νάπῃ. ἐνταῦθ᾽ ἐκτραπόμενοι ἐκάθηντο καὶ οὐκ ἔφασαν πορεύεσθαι. ὁ δὲ Ξενοφῶν ἔχων τοὺς ὀπισθοφύλακας, ὡς ᾔσθετο, ἐδεῖτο αὐτῶν πάσῃ τέχνῃ καὶ μηχανῇ μὴ ἀπολείπεσθαι, λέγων ὅτι ἕπονται πολλοὶ πολέμιοι συνειλεγμένοι, καὶ τελευτῶν ἐχαλέπαινεν· οἱ δὲ σφάττειν ἐκέλευον· οὐ γὰρ ἂν δύνασθαι πορευθῆναι. * * * * * * * αἱ δ᾽ οἰκίαι ἦσαν κατάγειοι, τὸ μὲν στόμα ὥσπερ φρέατος, κάτω δ᾽ εὐρεῖαι· αἱ δὲ εἴσοδοι τοῖς μὲν ὑποζυγίοις ὀρυκταί, οἱ δὲ ἄνθρωποι κατέβαινον ἐπὶ κλίμακος. ἐν δὲ ταῖς οἰκίαις ἦσαν αἶγες, οἶες, βόες, ὄρνιθες, καὶ τὰ ἔκγονα τούτων· τὰ δὲ κτήνη πάντα χιλῷ ἔνδον ἐτρέφοντο. ἦσαν δὲ καὶ πυροὶ καὶ κριθαὶ καὶ ὄσπρια καὶ οἶνος κρίθινος ἐν κρατῆρσιν. ἐνῆσαν δὲ καὶ αὐταὶ αἱ κριθαὶ ἰσοχειλεῖς, καὶ κάλαμοι ἐνέκειντο, οἱ μὲν μείζους οἱ δὲ ἐλάττους, γόνατα οὐκ ἔχοντες· τούτους ἔδει, ὁπότε τις διψῴη, λαβόντα εἰς τὸ στόμα μύζειν. καὶ πάνυ ἄκρατος ἦν, εἰ μή τις ὕδωρ ἐπιχέοι· καὶ πάνυ ἡδὺ συμμαθόντι τὸ πόμα ἦν. ὁπότε δέ τις φιλοφρονούμενός τῳ βούλοιτο προπιεῖν, εἷλκεν ἐπὶ τὸν κρατῆρα, ἔνθεν ἐπικύψαντα ἔδει ῥοφοῦντα πίνειν ὥσπερ βοῦν.

2. From Xenophon, *Memorabilia Socratis*, II, 4.

ἤκουσα δέ ποτε αὐτοῦ καὶ περὶ φίλων διαλεγομένου, ἐξ ὧν ἔμοιγε ἐδόκει μάλιστ᾽ ἄν τις ὠφελεῖσθαι πρὸς φίλων κτῆσίν τε καὶ χρείαν. τοῦτο μὲν γὰρ δὴ πολλῶν ἔφη ἀκούειν, ὡς πάντων κτημάτων κράτιστον εἴη φίλος σαφὴς καὶ ἀγαθός· ἐπιμελομένους δὲ παντὸς μᾶλλον ὁρᾶν ἔφη τοὺς πολλοὺς ἢ φίλων κτήσεως. * * * * * καίτοι πρὸς ποῖον κτῆμα τῶν ἄλλων παραβαλλόμενος φίλος ἀγαθὸς οὐκ ἂν πολλῷ κρείττων φανείη; ποῖος γὰρ ἵππος ἢ ποῖον ζεῦγος οὕτω χρήσιμον ὥσπερ ὁ χρηστὸς φίλος, ποῖον δὲ ἀνδράποδον οὕτως εὔνουν καὶ παραμόνιμον, ἢ ποῖον ἄλλο κτῆμα οὕτω πάγχρηστον; ὁ γὰρ ἀγαθὸς φίλος ἑαυτὸν τάττει πρὸς πᾶν τὸ ἐλλεῖπον τῷ φίλῳ καὶ τῆς τῶν ἰδίων κατασκευῆς καὶ τῶν κοινῶν πράξεων· καί, ἄν τέ τινα εὖ ποιῆσαι δέῃ, συνεπισχύει, ἄν τέ τις φόβος ταράττῃ, συμβοηθεῖ, τὰ μὲν συναναλίσκων, τὰ δὲ συμπράττων, καὶ τὰ μὲν συμπείθων, τὰ δὲ βιαζόμενος, καὶ εὖ μὲν πράττοντας πλεῖστα εὐφραίνων, σφαλλομένους δὲ πλεῖστα ἐπανορθῶν. ἃ δὲ αἵ τε χεῖρες ἑκάστῳ ὑπηρετοῦσι καὶ οἱ ὀφθαλμοὶ προορῶσι καὶ τὰ ὦτα προακούουσι καὶ οἱ πόδες διανύτουσι, τούτων φίλος εὐεργετῶν οὐδενὸς λείπεται· πολλάκις δέ, ἃ πρὸ αὑτοῦ τις οὐκ ἐξειργάσατο ἢ οὐκ εἶδεν ἢ οὐκ ἤκουσεν ἢ οὐ διήνυσε, ταῦτα ὁ φίλος πρὸ τοῦ φίλου ἐξήρκεσεν. ἀλλ᾽ ὅμως ἔνιοι δένδρα μὲν πειρῶνται θεραπεύειν τοῦ καρποῦ ἕνεκεν, τοῦ δὲ παμφορωτάτου κτήματος, ὃ καλεῖται φίλος, ἀργῶς καὶ ἀνειμένως οἱ πλεῖστοι ἐπιμέλονται.

II.—1. Select from both extracts such verbs as are notably defective or anomalous in conjugation, and mention those tense-forms of each which are actually used by good Attic authors:—point out all the verbs which are here employed reflexively—not passively, and those which, while active as to form, have an intransitive or neuter signification:—notice any cases where the verbal augment is omitted, and, in the remarks which that circumstance will suggest, discriminate Attic usage from Homeric, the prose style from that of poetry.

2. Mark and elucidate all constructions, in both extracts, which are characteristic of the Greek idiom; supplying *elleipses*,—explaining every noticeable usage of the genitive and other oblique cases in nouns, and of the subjunctive mode (present or past) in verbs,—accounting for the presence or the omission of the article before φίλος, wherever that word occurs in the second extract,—exemplifying the combination of plural as well as of singular verbs with plural nominatives of the neuter gender,—distinguishing ᾱ̓ν from ᾰ̓ν in regard to signification, position, and government,—showing how, and to what extent, the syntax of participles differs in Greek and Latin,—translating into Latin the clauses, οὐκ ἔφασαν πορεύεσθαι,—οὐ γὰρ ἂν δύνασθαι πορευθῆναι,—ἐδεῖτο αὐτῶν μὴ ἀπολείπεσθαι,—ἔνθεν ἐπικύψαντα ἔδει ῥοφοῦντα πίνειν ὥσπερ βοῦν.

3. Derive or decompound δάκτυλος, ἱμάς, μηχανή, κλῖμαξ, χρεία, πόμα, κτῆνος, κρατήρ, ἄκρατος, ἀνδράποδον, ὀρυκτός, ἔνιοι, ὑποζύγιον, ἐπικούρημα, κατάγειος, νεόδαρτος, ἰσοχειλής, ὀπισθοφύλαξ, πάγχρηστος, παραμόνιμος, ἀργῶς, ἀνειμένως, μύζω, εὐφραίνω, διανύτω, εὐεργετέω, ὑπηρετέω, ἐπανορθόω, φιλοφρονοῦμαι.

LATIN.—*Examiner, Rev. Dr. Reichel.*

TO THE REVEREND JOSEPH WARTON.

Though, when you and your brothers were in town, you did not think my humble habitation worth a visit, yet I will not so far give way to sullenness as not to tell you that I have lately seen a book which I suspect to be yours, though I have not yet read ten pages. That way of publishing, without acquainting your friends, is a wicked trick. However, I will not so far depend upon a mere conjecture as to charge you with a fraud which I cannot prove you to have committed.

For my part, I have not lately done much. I have been ill in the winter, and my eye has been inflamed: but I please myself with the hopes of doing many things with which I have long pleased and deceived myself.

What becomes of poor dear Collins? I wrote him a letter which he never answered. I suppose writing is very troublesome to him. That man is no common loss. The moralists all talk of the uncertainty of fortune, and the transitoriness of beauty: but it is yet more dreadful to consider that the powers of the mind are equally liable to change, that understanding may make its appearance and depart, that it may blaze and expire.

Let me not be long without a letter from you, and I will forgive you the omission of a visit; and if you can tell me that you are now more happy than before, you will give great pleasure to your most affectionate and most humble servant, SAMUEL JOHNSON.

HISTORY AND THE ENGLISH LANGUAGE.—*Examiner, Professor Craik.*

1. Give an account of some English work which you have read, with your judgment upon it.

2. Describe the kind, or kinds, of reading or study to which you are most attached, stating the grounds of your preference.

3. Sketch rapidly, but distinctly, the general course of English History, from the invasion of the Angles and Saxons to the invasion of the Normans.

4. Give the best account you can of the course of events in the reign either of Henry III., or of Edward III., or of George III., simply stating facts in connexion one with another, without entering into any speculation about them.

5. Explain the succession of the Roman Emperors from Julius Cæsar to Nero inclusive; giving the date of the accession of each, and stating distinctly his relationship to his predecessors.

6. Enumerate in the order of time the principal wars carried on by the Romans in the interval between the termination of the Punic wars and the breaking out of the Civil war between Marius and Sulla, giving as many dates as you can.

Of these questions every competitor must attempt both the 1st and 2nd, with at least one of those in English and one of those in Roman History.

SECOND YEAR STUDENTS.

GREEK.—*Examiner, Professor MacDouall.*

Translate closely and perspicuously the following passages, and annex concise notes critical and illustrative:—

1. From the *Ilias*, XIII., 610—639:

'Ατρείδης δὲ ἐρυσσάμενος ξίφος ἀργυρόηλον,
&c., &c., down to
ἢ πολέμου· Τρῶες δὲ μάχης ἀκόρητοι ἔασιν."

2. From the *Phoenissae* of EURIPIDES, vv. 784—817.

ΧΟΡΟΣ

ὦ πολύμοχθος Ἄρης! τί ποθ' αἵματι καὶ θανάτῳ κατέχει
Βρομίου παράμουσος ἑορταῖς; στρ.
οὐκ ἐπὶ καλλιχόροις στεφάνοισι νεάνιδος ὥρας
βόστρυχον ἀμπετάσας λωτοῦ κατὰ πνεύματα μέλπει
μοῦσαν, ἐν ᾇ χάριτες χοροποιοί,
ἀλλὰ σὺν ὁπλοφόροις, στρατὸν Ἀργείων ἐπιπνεύσας
αἵματι Θήβας, κῶμον ἀναυλότατον προχορεύεις.
οὐ πόδα θυρσομανῆ νεβρίδων μέτα δινεῖς·
ἅρμα σὺ καὶ ψαλίοις τετραβάμονα μώνυχα πῶλον,
Ἰσμηνοῦ περὶ χεύμασι βαίνων,
ἱππείοισι θοάζεις, κοσμήσας θιασώταν
Σπαρτῶν γέννας
ἀσπιδοφέρμονα χάλκεον εὔοπλον
ἀντίπαλον κατὰ λάϊνα τείχεα.
ἦ δεινά τις Ἔρις θεός, ἃ τάδε
μήσατο πήματα γᾷ βασιλεῦσί τε
Λαβδακίδαις πολυμόχθοις.

ὦ ζαθέων πετάλων πολυθηρότατον νάπος, Ἀρτέμιδος χιονοτρόφον
Ὄμμα, Κιθαιρών! ἀντιστρ.
μήποτε τὸν θανάτῳ προτεθέντα, λόχευμ' Ἰοκάστας,
ὤφελες Οἰδιπόδαν θρέψαι, βρέφος ἔκβολον οἴκων
χρυσοδέτοις περόναις ἐπίσαμον!
μηδὲ τὸ παρθένιον πτερόν, οὔρειον τέρας, ἐλθεῖν,
πένθεα γαίας, Σφιγγὸς ἀμουσοτάταισι σὺν ᾠδαῖς!
ἅ ποτε Καδμογενῆ τετραβάμοσι χηλαῖς,
τείχεσι χριμπτομένα, φέρεν αἰθέρος εἰς ἄβατον φῶς
γένναν, τὰν ὁ κατὰ χθονὸς Ἅιδας
Καδμείοις ἐπιπέμπει· δυσδαίμων δ' ἔρις ἄλλα
θάλλει παίδων
Οἰδιπόδα κατὰ δώματα καὶ πόλιν.
οὐ γὰρ ὃ μὴ καλὸν οὔποτ' ἔφυ καλόν,
οὐδὲ τὸ μὴ νόμιμον νόμιμον πέσε
ματρὶ λόχευμα, μίασμα λέχους πατρὸς
ἥ γε συναίμονος ἦλθεν.

You may report and comment upon such various readings in these *strophes* as you remember.

I.—Translate accurately the following extract from the *Phaedon* of PLATON, c. 39:

ἀλλὰ πρῶτον εὐλαβηθῶμέν τι πάθος μὴ πάθωμεν. τὸ ποῖον; ἦν δ' ἐγώ. μὴ γενώμεθα, ἦ δ' ὅς, μισόλογοι, ὥςπερ οἱ μισάνθρωποι γιγνόμενοι· ὡς οὐκ ἔστιν, ἔφη, ὅ τι ἄν τις μεῖζον κακὸν πάθοι ἢ λόγους μισήσας. γίγνεται δὲ ἐκ τοῦ αὐτοῦ τρόπου μισολογία τε καὶ μισανθρωπία. ἥ τε γὰρ μισανθρωπία ἐνδύεται ἐκ τοῦ σφόδρα τινὶ πιστεῦσαι ἄνευ τέχνης καὶ ἡγήσασθαι παντάπασιν ἀληθῆ εἶναι καὶ ὑγιῆ καὶ πιστὸν τὸν ἄνθρωπον, ἔπειτα ὀλίγον ὕστερον εὑρεῖν τοῦτον πονηρόν τε καὶ ἄπιστον καὶ αὖθις ἕτερον· καὶ, ὅταν τοῦτο πολλάκις πάθῃ τις, καὶ ὑπὸ τούτων μάλιστα οὓς ἂν ἡγήσηται οἰκειοτάτους τε καὶ ἑταιροτάτους, τελευτῶν δὴ θαμὰ προςκρούων μισεῖ τε πάντας καὶ ἡγεῖται οὐδενὸς οὐδὲν ὑγιὲς εἶναι τὸ παράπαν. ἢ οὐκ ᾔσθησαι οὕτω πως τοῦτο γιγνόμενον; πάνυ γε, ἦν δ' ἐγώ. οὐκοῦν, ἦ δ' ὅς, αἰσχρόν; καὶ δῆλον, ὅτι ἄνευ τέχνης τῆς περὶ τἀνθρώπεια ὁ τοιοῦτος χρῆσθαι ἐπιχειρεῖ τοῖς ἀνθρώποις; εἰ γάρ που μετὰ τέχνης ἐχρῆτο, ὥςπερ ἔχει, οὕτως ἂν ἡγήσατο, τοὺς μὲν χρηστοὺς καὶ πονηροὺς σφόδρα ὀλίγους εἶναι ἑκατέρους, τοὺς δὲ μεταξὺ πλείστους. πῶς λέγεις; ἦν δ' ἐγώ. ὥςπερ, ἦ δ' ὅς, περὶ τῶν σφόδρα μικρῶν καὶ μεγάλων. οἴει τι σπανιώτερον εἶναι ἢ σφόδρα μέγαν ἢ σφόδρα μικρὸν ἐξευρεῖν ἄνθρωπον ἢ κύνα ἢ ἄλλο ὁτιοῦν; ἢ αὖ ταχὺν ἢ βραδὺν, ἢ αἰσχρὸν ἢ καλὸν, ἢ λευκὸν ἢ μέλανα; ἢ οὐχὶ ᾔσθησαι, ὅτι πάντων τῶν τοιούτων τὰ μὲν ἄκρα τῶν ἐσχάτων σπάνια καὶ ὀλίγα, τὰ δὲ μεταξὺ ἄφθονα καὶ πολλά; πάνυ γε, ἦν δ' ἐγώ. οὐκοῦν οἴει, ἔφη, εἰ πονηρίας ἀγὼν προτεθείη, πάνυ ἂν ὀλίγους καὶ ἐνταῦθα τοὺς πρώτους φανῆναι; εἰκός γε, ἦν δ' ἐγώ. εἰκὸς γάρ, ἔφη. ἀλλὰ ταύτῃ μὲν οὐχ ὅμοιοι οἱ λόγοι τοῖς ἀνθρώποις εἰσίν, ᾗ σοῦ νῦν δὴ προάγοντος ἐγὼ ἐφεσπόμην, ἀλλ' ἐκείνῃ, ἐπειδάν τις πιστεύσῃ λόγῳ τινὶ ἀληθεῖ εἶναι ἄνευ τῆς περὶ τοὺς λόγους τέχνης, κἄπειτα ὀλίγον ὕστερον αὐτῷ δόξῃ ψευδὴς εἶναι, ἐνίοτε μὲν ὤν, ἐνίοτε δ' οὐκ ὤν, καὶ αὖθις ἕτερος καὶ ἕτερος. καὶ μάλιστα δὴ οἱ περὶ τοὺς ἀντιλογικοὺς λόγους διατρίψαντες οἶσθ' ὅτι τελευτῶντες οἴονται σοφώτατοι γεγονέναι καὶ κατανενοηκέναι μόνοι, ὅτι οὔτε τῶν πραγμάτων οὐδενὸς οὐδὲν ὑγιὲς οὐδὲ βέβαιον οὔτε τῶν λόγων, ἀλλὰ πάντα τὰ ὄντα, ἀτεχνῶς ὥς περ ἐν Εὐρίπῳ, ἄνω καὶ κάτω στρέφεται καὶ χρόνον οὐδένα ἐν οὐδενὶ μένει.

II.—Retranslate the following extract from the *Cyropaedeia* of XENOPHON:

"I believe that no virtue is cultivated by men in order that those who become proficient therein may have no advantage over the base. Those, for instance, who refrain from present pleasures do not so act in order that they may never be delighted, but they thus prepare themselves as being likely through this temperance to enjoy for the future manifold delights: those again who exert themselves to become accomplished in speaking practise this art, not that they may never desist from fluent talk, but in the hope that, gaining over men by their fluency, they shall earn many important advantages for themselves: and those who follow the pursuits of war so task themselves, not in order that they may never be done fighting, but under the conviction that, by becoming expert in war, they shall secure for both themselves and their country abundant wealth, great prosperity, and signal honours. Now, if any, after undergoing these fatigues, have allowed themselves to be disabled by old age before deriving any fruit from them, they seem to me at least to be in the same condition as if one having studied to become a good husbandman, both sowing aright and planting aright, should, when it behoved him to reap the fruits of those labours, permit the grain ungarnered to sink again into the earth."

LATIN.—*Examiner, Rev. Dr. Reichel.*

The intelligence of the melancholy end of Gallus soon reached Augustus, and made the stronger impression on him, from several influential voices having been already raised in disapproval of the Senate's premature and severe decree, and expressing doubts as to the sincerity of his accusers. Now that Gallus had himself decided matters in such a way as allowed of no recal or mitigation of his sentence, and that the emperor had no longer any anxiety about his own safety, the consciousness of great injustice having been committed took its place. A true version of what had passed at the house of Lentulus soon got abroad, and it became by degrees established that Gallus was much less guilty than had been supposed, and that he had fallen a victim to an intrigue, which the hostilely-disposed Senate had embraced as a welcome opportunity for his destruction. Augustus then loudly lamented the fate which robbed him alone, among all men, of the liberty of being angry with his friends, according to his own measure and will. He firmly denounced the decree which made him master over the property of Gallus, and ordained that whatever disposition of it might have been previously made, should have full effect. The Senate, with the same alacrity with which they had entertained the accusation, now proceeded to declare that all guilt had been effaced by his death, and that nothing should stand in the way of an honourable funeral.

In the other parts of Rome the most violent indignation was excited by the news of the death of Gallus and of the treachery employed against him. Pomponius was nowhere to be found; but Largus was made to feel in full measure the contempt due to his villany. On his appearance next morning in the forum, a man with whom he was unacquainted stepped forward and asked whether he knew him. On Largus replying in the negative, he called his companion as a witness, and made him sign his name to a tablet containing this avowal, in order to be secure against any charge which Largus might bring against him. Another, as Largus approached, held his hand before his mouth and nose, and advised the bystanders to do the same, since it was scarcely safe even to breathe in the vicinity of such a person.

APPENDIX, No. 8.

Scholarship Examinations

ENGLISH LANGUAGE.—*Examiner, Professor Craik.*

Every competitor must write a short essay on *some one* of the following subjects:—

Internal and External Evidence;
An Analytic as compared with a Synthetic Language;
The Substantive, the Adjective, and the Verb logically defined and distinguished;
The Law according to which one language borrows words from another;
What we owe to Speech;
What we owe to Writing;
What we owe to Printing;
Dumbness;
Blindness.

1. Enumerate, in the order of time, the successive languages that are known to have been native in the country now called England, either to the whole or to a portion of the population, from the earliest times to the present day, giving the periods during which they severally prevailed.

2. State the main constituents of the English Language as it now exists.

3. Explain the name by which the English Language is known, both in its origin and in its continued application under the varying circumstances of the case.

4. Explain the terms Saxon and Anglo-Saxon, as applied whether to the language or to the people, and examine the propriety of their application.

5. Define the position of the English Language, regarded with reference to the fundamental portion of its vocabulary, in the scheme of what is called the Indo-European Family of Languages.

6. Describe the works entitled the Brut of Layamon and the Ormulum in respect of the era, the authorship, the subject, and the language of each.

MODERN LANGUAGES.—*Examiner, Dr. Frings.*

FRENCH.

La naissance et les biens ne vont pas toujours ensemble. Diverses aventures de guerre et de famille avaient ruiné notre branche, et laissé mes derniers pères avec peu de fortune et d'éclat pour leur service militaire. Mon grandpère, qui avait suivi toutes les guerres de son temps, et toujours passionné royaliste, s'était retiré dans ses terres, où son peu d'aisance l'engagea de suivre la mode du temps, et de mettre ses deux aînés pages de Louis XIII., où les gens des plus grands noms se mettaient alors.

Le roi était passionné pour la chasse qui était sans meute et sans cette abondance de chiens, de piqueurs, de relais, de commodités, que le roi son fils y a apportés, et surtout sans routes dans les forêts. Mon père qui remarqua l'impatience du roi à relayer imagina de lui tourner le cheval qu'il lui présentait, la tête à la croupe de celui qu'il quittait. Par ce moyen, le roi, qui était dispos, sautait de l'un sur l'autre sans mettre pied à terre, et cela était fait en un moment; cela lui plut tant que peu à peu il le prit en affection, et valut à mon père la charge de premier écuyer.—SAINT-SIMON.

There subsists a general relation between the external organs of an animal by which it procures its food, and the internal powers by which it digests it. The constitution of the stomach agrees exactly with the form of the members. Accordingly, it has been found by experiments, tried not many years ago, with perforated balls, that the gastric juice of the ruminating animals, such as the sheep and the ox, speedily dissolves vegetables, but makes no impression upon animal bodies.

The relation of the kidneys to the bladder is as manifest as it is amongst the different vessels employed in a distillery, or in the communications between them. Relation of parts to one another accompanies us throughout the whole animal economy. Can any relation be more simple yet more convincing than this, that the eyes are so placed as to look in the direction in which the legs move and the hands work? It might have happened very differently if it had been left to chance. There were, at least three quarters of the compass out of four to have erred in. Any considerable alteration in the position of the eye, or the figure of the joints, would have disturbed the line, and destroyed the alliance between the sense and the limbs.

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1. Name the principal French historians of the eighteenth century, and their chief works.

2. What department of French literature was much neglected under the reign of Louis XIV.?

3. To what is it to be attributed that the French language and literature have become general almost through the whole of Europe since the age of Louis XIV.?

4. On which of *Voltaire's* writings does his fame chiefly rest?

5. Enumerate the principal writers of the age of Louis XIV., adding such of their works as you recollect.

6. What department of French literature was most cultivated and carried to the highest pitch of perfection in the reign of Louis XIV.?

7. Reduce the Past Participles *né, conquis, dû, bu, tû*, to their Infinitive Moods.

8. Translate:—"*Why do you not make them rise earlier?*" "*Why do you not make the children spell those words?*"

9. Translate:—"*My steward sold three hundred and eighty sheep last autumn, but this autumn he will only be able to sell two hundred.*"

10. Describe the condition of French literature during the eighteenth century, and state wherein it differed from that of the seventeenth century.

THIRD YEAR STUDENTS.

GREEK.—*Examiner, Professor MacDouall.*

I.—Translate, and illustrate in historical and critical notes, the following passage from THUCYDIDES:—

Ἐπειδὴ δὲ οἵ τε Ἀθηναίων τύραννοι καὶ οἱ ἐκ τῆς ἄλλης Ἑλλάδος ἐπὶ πολὺ καὶ πρὶν τυραννευθείσης οἱ πλεῖστοι καὶ τελευταῖοι, πλὴν τῶν ἐν Σικελίᾳ, ὑπὸ Λακεδαιμονίων κατελύθησαν, (ἡ γὰρ Λακεδαίμων μετὰ τὴν κτίσιν τῶν νῦν ἐνοικούντων αὐτὴν Δωριέων ἐπὶ πλεῖστον ὧν ἴσμεν χρόνον στασιάσασα ὅμως ἐκ παλαιοτάτου καὶ εὐνομήθη καὶ ἀεὶ ἀτυράννευτος ἦν· ἔτη γάρ ἐστι μάλιστα τετρακόσια καὶ ὀλίγῳ πλείω ἐς τὴν τελευτὴν τοῦδε τοῦ πολέμου, ἀφ' οὗ Λακεδαιμόνιοι τῇ αὐτῇ πολιτείᾳ χρῶνται, καὶ δι' αὐτὸ δυνάμενοι καὶ τὰ ἐν ταῖς ἄλλαις πόλεσι καθίστασαν) μετὰ δὲ τὴν τῶν τυράννων κατάλυσιν ἐκ τῆς Ἑλλάδος οὐ πολλοῖς ἔτεσιν ὕστερον καὶ ἡ ἐν Μαραθῶνι μάχη Μήδων πρὸς Ἀθηναίους ἐγένετο. δεκάτῳ δὲ ἔτει μετ' αὐτὴν αὖθις ὁ Βάρβαρος τῷ μεγάλῳ στόλῳ ἐπὶ τὴν Ἑλλάδα δουλωσόμενος ἦλθε. καί, μεγάλου κινδύνου ἐπικρεμασθέντος, οἵ τε Λακεδαιμόνιοι τῶν ξυμπολεμησάντων Ἑλλήνων ἡγήσαντο δυνάμει προύχοντες, καὶ οἱ Ἀθηναῖοι, ἐπιόντων τῶν Μήδων, διανοηθέντες ἐκλιπεῖν τὴν πόλιν καὶ ἀνασκευασάμενοι ἐς τὰς ναῦς ἐσβάντες ναυτικοὶ ἐγένοντο. κοινῇ δὲ ἀπωσάμενοι τὸν Βάρβαρον ὕστερον οὐ πολλῷ διεκρίθησαν πρός τε Ἀθηναίους καὶ Λακεδαιμονίους οἵ τε ἀποστάντες βασιλέως Ἕλληνες καὶ οἱ ξυμπολεμήσαντες. δυνάμει γὰρ ταῦτα μέγιστα διεφάνη· ἴσχυον γὰρ οἱ μὲν κατὰ γῆν, οἱ δὲ ναυσί. καὶ ὀλίγον μὲν χρόνον ξυνέμεινεν ἡ ὁμαιχμία, ἔπειτα δὲ διενεχθέντες οἱ Λακεδαιμόνιοι καὶ Ἀθηναῖοι ἐπολέμησαν μετὰ τῶν ξυμμάχων πρὸς ἀλλήλους· καὶ τῶν ἄλλων Ἑλλήνων εἴ τινές που διασταῖεν, πρὸς τούτους ἤδη ἐχώρουν. ὥστε ἀπὸ τῶν Μηδικῶν ἐς τόνδε ἀεὶ τὸν πόλεμον, τὰ μὲν σπενδόμενοι, τὰ δὲ πολεμοῦντες ἢ ἀλλήλοις ἢ τοῖς ἑαυτῶν ξυμμάχοις ἀφισταμένοις, εὖ παρεσκευάσαντο τὰ πολέμια καὶ ἐμπειρότεροι ἐγένοντο μετὰ κινδύνων τὰς μελέτας ποιούμενοι. καὶ οἱ μὲν Λακεδαιμόνιοι οὐχ ὑποτελεῖς ἔχοντες φόρου τοὺς ξυμμάχους ἡγοῦντο, κατ' ὀλιγαρχίαν δὲ σφίσιν αὐτοῖς μόνον ἐπιτηδείως ὅπως πολιτεύσουσι θεραπεύοντες, Ἀθηναῖοι δὲ ναῦς τε τῶν πόλεων τῷ χρόνῳ παραλαβόντες, πλὴν Χίων καὶ Λεσβίων, καὶ χρήματα τοῖς πᾶσι τάξαντες φέρειν. καὶ ἐγένετο αὐτοῖς ἐς τόνδε τὸν πόλεμον ἡ ἰδία παρασκευὴ μείζων ἢ ὡς τὰ κράτιστά ποτε μετὰ ἀκραιφνοῦς τῆς ξυμμαχίας ἤνθησαν.

II.—Translate also, and comment upon, this passage from the *Timaeus* of PLATON:—

Ἀκούοιτ' ἂν ἤδη τὰ μετὰ ταῦτα περὶ τῆς πολιτείας, &c., &c., down to ὅσα ἂν οἷά τε ἐν πολέμῳ καὶ μάχαις πράττοντες ἔργῳ καὶ λόγῳ προσομιλοῦντες ἑκάστοις πράττοιεν καὶ λέγοιεν.

III.—Translate the following passage into Attic prose:—

"Thus, then, one must beware of committing injustice rather than of suffering it, and must by all means make it a study not to seem virtuous, but to be so both in private and in public. But, if any one become in any way criminal, he must be punished: and indeed, next to *being* righteous, this is the second blessing—*to become* such, and by undergoing punishment to render satisfaction. But all flattery, in reference alike to one's self and to others, and in reference alike to few and to many, must be shunned, while rhetoric and every other faculty must be ever exercised with a single view toward rectitude.—Taking my counsel, then, follow me to that goal on reaching which you will remain happy both in life and after your decease. And permit any one to contemn you as a simpleton and to heap abuse upon you: ay! serenely allow one, if he will, to inflict upon you the ignominious stroke: for you will suffer no calamity, if you be indeed honourable and good, cultivating virtue. And then, having thus trained ourselves together, we shall, if it seem expedient, address ourselves to politics, or we shall deliberate on whatever subject may seem suitable, being more able for deliberation than we are now. For it were disreputable for us, while in the condition which is obviously ours at present, to swagger as if persons of some consequence;—us, who never hold by the same convictions upon the same subjects even the most important—so far are we gone in barbarism! Let us, then, use as a guide the reasoning now propounded, which demonstrates to us that our best course is this—to be found, both in life and in death, exercising justice and all besides that makes up virtue."

LATIN.—*Examiner, Rev. Dr. Reichel.*

English to be translated into Latin.

He who returned home thus late and lonely, without the usual accompaniment of slaves was CORNELIUS GALLUS, a man received and envied in the higher circles of the Roman world as the friend and favourite of Augustus, but secretly hated by them; for though not ashamed of slavishly cringing to the mighty despot, they looked haughtily on the exalted plebeian. He was, however, among the friends of the soberer as well as brighter muses, universally prized as a man of much learning, and celebrated as a graceful and elegant poet: while in the more select convivial circle he was beloved as a cheerful companion, who always said the best of good things, and whose presence gave to the banquet more animation than dancers and *choraulae*. Notwithstanding the renowned name he had taken, he had in reality no claim to the glorious family reminiscences which it suggested. The trophies indicative of former triumphs which decked the door and door-posts of his mansion, were the inalienable adjuncts of the house itself; earnest mementos of a glorious past, and serving as an admonition to each occupier, what his aim must be, would he avoid the humiliating feeling of living undistinguished in the habitation of renown. His grandfather had arrived a stranger in Rome, a little before the reign of terror, when C. Marius and L. Cornelius Cinna profited by the absence of the most powerful man of the time, to effect a reaction, the ephemeral success of which only served to prepare more securely the way to fame for the ambitious Sulla. It was through Cinna himself that Gallus obtained the right of citizen, and in conformity with the custom of the period he adopted the Cornelian name, along with the surname which denoted his extraction. But the horrors of Sulla's proscription drove him from Rome, and he returned to Gaul, where he had been since residing in ignoble obscurity at Forum Julii. There Gallus passed the first years of his childhood, under the careful auspices of his father, who saw in the happy disposition and lofty spirit of his boy the harbingers of no ordinary future. Therefore, although he could not be accounted wealthy, he determined to make every sacrifice in order to give his son such an education as usually fell to the lot of the sons of senators and knights.

MODERN LANGUAGES.—*Examiner, Dr. Frings.*

FRENCH.

Mais le principal ornement de l'hôtel de Rambouillet était Julie, l'aînée des deux sœurs. Quoique M^me^ de Rambouillet ait mérité de donner son nom à la société qu'elle a su former autour d'elle, Julie en demeurera le type le plus accompli.

Julie d'Angennes était la quatrième fille de M^me^ de Rambouillet, qui l'eut vers 1607. Avec son esprit naturel et les leçons de sa mère, elle prit part de bonne heure aux assemblées de l'illustre hôtel; et elle ne cessa de les animer pendant plus de vingt années jusqu'en 1645 où elle se maria, après s'en être longtemps défendue, par pure déférence aux instances de tout le monde et au désir de sa famille, comme si elle eût senti qu'elle était le génie de l'hôtel de Rambouillet, que sa destinée s'y devait accomplir, et qu'elle était faite pour être l'âme d'une société d'élite, et non pour paraître à la cour et y suivre la carrière des honneurs aux dépens de ses plus nobles facultés.

Avec toutes les ressemblances et toutes les différences qui unissaient et distinguaient M^me^ de Rambouillet et ses deux filles Julie et Angélique, on comprend aisément comment l'hôtel de Rambouillet fut, de 1620 à 1650, le théâtre de tous les divertissements, le rendez-vous de tout ce qu'il y avait de plus galant à la cour, de plus poli parmi les beaux-esprits.—VICTOR COUSIN.

FRENCH OR GERMAN.

What does happiness consist in? I am inclined to believe that happiness consists:

I. In the exercise of social affections. Those persons commonly possess good spirits who have about them many objects of affection and endearment. Another main article of human happiness is

II. The exercise of our faculties, either of body or mind, in the pursuit of some engaging end. It seems to be true, that no plenitude of present gratifications can make the possessor happy for a continuance, unless he has something in reserve,—something to hope for and look forward to.

III. Happiness depends upon the prudent constitution of the habits, and lastly, consists in health. So far as circumstances of fortune conduce to happiness, it is not the income which any man possesses, but the increase of income, that affords the pleasure. Two persons, of whom one begins with a hundred, and advances his income to a thousand pounds a year, and the other sets off with a thousand and dwindles down to a hundred, may, in the course of their time, have the receipt and spending of the same sum of money; yet their satisfaction, so far as fortune is concerned, will be very different.

FRENCH.

1. Enumerate the principal French prose writers of the seventeenth century, giving the titles of such of their works as you recollect.

2. Describe the condition of the French language at Ronsard's time.

3. Explain what is meant by the Indo-European family of languages.

4. What is the origin and recognised application of the terms *French* and *Francic?*

5. Why is the seventeenth century styled the age of Louis XIV.?

6. How are the words, *may, shall, will, must*, translated into French. Give examples.

7. Express in French *the twenty first of August, the third of July, the second of June.*

8 Translate:—"*I would have made you write to them, if I had known their address.*"

9. Enumerate the principal chroniclers in France previous to *Saint-Simon*, stating the time of their existence.

10. Give an account of *Boileau's* influence on French poetry. Name his principal works.

11. What difference is there between:—"*Je les ai entendu prononcer*" and "*Je les ai entendus (entendues) prononcer?*"

APPENDIX,
No. 8.

Scholarship Examinations

SCIENCE SCHOLARSHIPS.

FIRST YEAR STUDENTS.

MATHEMATICS.—*Examiner, Professor Tait.*

ALGEBRA.

1. Show that $(ad-bc)(a_1d_1-b_1c_1)=(aa_1+cb_1)(bc_1+dd_1)-(ac_1+cd_1)(ba_1+db_1)$, and that

$$x(\overline{x+y}^2-\overline{z+x}\;\overline{y+z})+y(\overline{y+z}^2-\overline{x+y}\;\overline{z+x})+z(\overline{z+x}^2-\overline{y+z}\;\overline{x+y})=\overline{x+y+z}(x^2+y^2+z^2-xy-yz-zx).$$

2. Enunciate and prove the rule for the extraction of the square root of any algebraic expression; apply it to find to 4 terms each the roots of $1-x^3$, $1-x$, and $1+x+x^2$; and compare the former with the product of the two latter.

3. The sum of two numbers is three times their difference, and the sum of the first and half the second is 50, what are the numbers?

4 Supposing that, instead of the last condition in question (3), the difference of the reciprocals of the numbers had been given$=\frac{1}{4}$, find the numbers.

5. If a quadratic equation be put in the form $x^2+px+q=0$; find the values of its roots (α, β) in terms of p and q, and show that

$$x^2+px+q=(x-\alpha)(x-\beta)$$

Hence show that if for x there be substituted a quantity intermediate in value to the roots, the left hand side of the equation will become a negative quantity. From this prove that the roots have the same sign if q is positive.

6. Find the sum of

$$\left.\begin{array}{ll} \alpha) & \text{16 terms of 23, 17. 11, \&c.} \\ \text{and } \beta) & \text{13 terms of 12, 36, 108, \&c.} \end{array}\right\}$$

How many terms of $1, -\frac{1}{2}, -\frac{1}{4}, -\frac{1}{8}$, &c., amount to $\frac{1}{2^{100}}$?

7. Solve the equations

$$\alpha) \quad \left\{\begin{array}{l} \cdot05x-\cdot15y=\cdot03 \\ \cdot71x+\cdot2y=\cdot8 \end{array}\right\}$$

$$\beta) \quad \frac{x-1}{2-x}=\frac{21-5x}{4x-17}.$$

8. Define the logarithm of a number to a given base. What are the bases generally used, and why? Prove the rules for effecting multiplication and extraction of roots, by addition and division of logarithms.

9. Given

$$\text{and}\left\{\begin{array}{l} \log_{10} 2\cdot0=\cdot301030 \\ \log_{10} 3\cdot0=\cdot477121 \\ \log_{10} 250\cdot53=2\cdot398858 \end{array}\right\}\text{find}\left\{\begin{array}{l} \log_{10} 0\cdot125 \\ \log_{10} 1\cdot\dot{1} \\ \text{and } \sqrt[27]{3^{162}2^{12}} \end{array}\right\}$$

GEOMETRY, TRIGONOMETRY, &c.

1. The three angles of any triangle are together equal to two right angles. Prove this, and deduce expressions for the sums of the interior and exterior angles of any rectilinear polygon. Extend these to a quadrilateral, two of whose opposite sides intersect,

(thus,).

2. If A be a point without a circle, O the centre, AP a tangent, and QM the perpendicular on AO from any point Q in the circumference, show that $PA^2+AQ^2=2AO.AM$.

3. A, B, C, are given points in a straight line, where must the point P be situated so that $AB : BC :: AP : PC$?

4. A and B are given points, and CPD, EQF given straight lines; find P and Q so that $AP+PQ+QB$ may be the least possible.

5. Define the secant and tangent of an angle, and find the relation between them.

If $\tan A \sec A=1$ what is the value of $\sin A$?

6. If any one of the trigonometrical ratios of an angle be given (suppose the cosecant) show that there is only a finite number of values of the other (the versed-sine for instance)—Why is this?

7. Investigate a formula for the cosine of any angle in terms of the sides of a triangle. Does this formula really involve the *actual* lengths of the sides? Give a reason for your answer.

8. If two triangles have their bases and perimeters equal, show that the ratio of their areas depends only on the products of their sides.

9. Prove that $\tan\theta=\sqrt{\frac{1-\cos 2\theta}{1+\cos 2\theta}}$,

and that $\frac{(\cos\theta+\sin\theta)^3-(\cos\theta-\sin\theta)^3}{(\cos\theta+\sin\theta)^3+(\cos\theta-\sin\theta)^3}=\tan\theta\frac{2+\cos 2\theta}{2-\cos 2\theta}$.

10. An isosceles triangle can be geometrically constructed so that the angle at the vertex may be 2, 3, 4, 8 or 10 times each of the angles at the base. Calculate the ratio of the base to the side in the two last cases.

SECOND YEAR STUDENTS.

MATHEMATICS.—*Examiner, Professor Tait.*

ALGEBRA, &c.

1. Simplify as much as possible

$$(a+b-c)\frac{a^2+b^2}{a^2b^2}+(c+a-b)\frac{c^2+a^2}{c^2a^2}+(b+c-a)\frac{b^2+c^2}{b^2c^2}$$

and $$\frac{x^{\frac{3}{2}}-xy^{\frac{1}{2}}+x^{\frac{1}{2}}y-y^{\frac{3}{2}}}{x^{\frac{5}{2}}-x^2y^{\frac{1}{2}}+3x^{\frac{3}{2}}y-3xy^{\frac{3}{2}}+x^{\frac{1}{2}}y^2-y^{\frac{5}{2}}}$$

2. Solve the equations

$$\alpha) \quad \sqrt{a+x}+\sqrt{a-x}=\sqrt{b}$$

$$\beta) \quad \frac{x^2+2x+2}{x+1}+\frac{x^2+8x+20}{x+4}=\frac{x^2+4x+6}{x+2}+\frac{x^2+6x+12}{x+3}.$$

3. Eliminate y and z between the equations

$$\left.\begin{array}{l} x+y+z=a \\ xy+yz+zx=b \\ xyz=c \end{array}\right\}.$$

4. Show that the cube of any integer leaves the same remainder when divided by 6 that the integer itself does.

5. In what sense is the equation $a^ma^n=a^{m+n}$ generally true; *i.e.*, is it a Theorem, or a Definition, or does it in some cases belong to one, and in others to the other class?

6. n tickets, of which all but one are blanks, are put in a bag, and one is drawn by each of n individuals in succession. Show that their chances of the prize are equal.

7. Find the sums of the series whose xth terms are

$$\left.\begin{array}{ll} \alpha) & a^x \\ \beta) & \frac{1}{x(x+1)} \end{array}\right\}\text{ to } x \text{ terms and to } \infty.$$

8. The successive convergents to a continued fraction approach more and more closely to its value, and by excess and defect alternately, and no fraction can approach closer to the actual value than any of the convergents unless it have a greater denominator.

9. Find *all* the solutions in positive integers of the equation

$$x+2y+3z=10.$$

10. Three objects, A, B, and C (whose distances from each other are known) are situated in a horizontal plane. Determine the *height* of the station at which these distances subtend given angles.

What additional data would be required for the solution of the problem, if ABC were a straight line?

CONIC SECTIONS.

The propositions to be proved *geometrically.*

1. Define the *Parabola*, its *Focus* and *Directrix*, and the *Ordinate*, *Normal*, and *Diameter* for any point in the curve.

2. The locus of the foot of the perpendicular from the focus on the tangent is the tangent at the vertex.

3. If two parallel chords be given, give a construction for the focus and directrix.

4. The tangents to an Hyperbola form with the Asymptotes triangles of constant area.

PLANE CO-ORDINATE GEOMETRY.

1. Explain the method of determining a point by co-ordinates, and show that an equation between x and y represents generally a curve.

2. The general equation of the first degree

$$\{Ax+By+C=0\}$$

represents a straight line. On what property of a straight line is your proof founded?

3. Find the equation to a line which passes through the point (a, b) and with the co-ordinate axes bounds an area $=c^2$.

4. Find the *equation* to the perpendicular from (a, b) upon the line $\frac{x}{a}+\frac{y}{b}=1$, and show that its length is $\frac{ab}{\sqrt{a^2+b^2}}$.

5. Show that the equation to a circle whose centre is at the origin, and radius$=a$, is $x^2+y^2=a^2$.

This is equivalent to the two equations

$$\left\{\begin{matrix} y=k(x-a) \\ y=-\frac{1}{k}(x+a) \end{matrix}\right\}$$

whatever be k. What do these equations represent, and what theorem do they at once prove?

DIFFERENTIAL CALCULUS.

1. What is the differential co-efficient of a function of one variable? Apply your definition to deduce *directly* those of

$$x^5, \frac{1-x}{1+x}, \cos x \text{ and } \tan^{-1}x.$$

2. Differentiate the expressions

$$\cos \epsilon^x, \frac{x}{\sqrt{1+x^2}} \text{ and } x^{x^2}.$$

3. If $\Theta=x\cos\theta+y\sin\theta-a$, what is represented in plane co-ordinate geometry by

$$\frac{d\Theta}{d\theta}=0?$$

Third Year Students.

Mathematics.—*Examiner, Professor Tait.*

THEORY OF EQUATIONS, &c.

1. Show that, if a be positive and $b \angle a$, the expression $\frac{1}{a-x}-\frac{1}{b-x}$ has no positive value less than $\frac{4}{a-b}$.

2. Solve the equations

α) $(x^2+4x-2)^2+3=4x(3x^2+4)$

β) $\frac{\sqrt{X}}{Y}+\frac{p}{\sqrt{Y}}=\frac{q}{\sqrt{X}}$ where $\left\{\begin{matrix} aX+bY+cx=d \\ a_1X+b_1Y+c_1x=d_1 \end{matrix}\right\}$

γ) $x^6-2x^3\cos\theta+1=0.$

3. Define a recurring equation, and show that its order may be depressed by half.

4. The roots of an equation of the third degree are in $A. P$, find them.

5. A root of $f^1(x)=0$ lies between each pair of real roots of $f(x)=0$. Prove this, and apply it to find *equal* roots in an equation.

6. Explain Horner's method of approximating to the numerical values of the real roots of an equation, and find to 4 decimal places the real root of $x^5-2x-2=0$.

7. Given the angles of a spherical triangle, find its area. If two spherical triangles have their sides proportionals, what may be proved of them?

8. In an equilateral quadrantal triangle find the radii of the inscribed and circumscribed small circles.

9. There are two arcs, one of which bisects the other and is trisected by it. The arcs joining their extremities towards the same parts are given in length, and belong to given great circles. Find an equation whose solution would enable you to construct the problem.

Appendix, No. 8.

Scholarship Examinations

Enunciate, and work out completely, the corresponding plane problem.

10. If α, β, γ be linear functions of x and y, what is the condition that $\lambda\alpha+\mu\beta+\nu\gamma=0$ touch the conic

$$\sqrt{l\alpha}+\sqrt{m\beta}+\sqrt{n\gamma}=0?$$

Hence find the equation to the polar of $\frac{\alpha}{a}=\frac{\beta}{b}=\frac{\gamma}{c}$.

11. If $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and $\frac{x^2}{a^2+h}+\frac{y^2}{b^2+h}=1$ intersect, it is at right angles.

12. Investigate (after Newton) the force to the centre when a particle describes a circle about a point in its circumference.

DIFFERENTIAL CALCULUS, &c.

1. Find the value of $\sin\theta\cos\phi+\sin 2\theta\cos 2\phi+\ldots\ldots\ldots+\sin\overline{n-1}\theta\cos\overline{n-1}\phi$, when $\theta=p\left(\frac{2\pi}{n}\right)$, $\phi=q\left(\frac{2\pi}{n}\right)$ and p, q, and n are integers. Examine particularly the case of $p=q$.

2. Find the maximum and minimum values of z when

$$(z-a)^2=\sqrt{x^2+y^2}(2a-\sqrt{x^2+y^2}).$$

3. Find the equation to the system of parabolas whose axes coincide with that of x, and which are enveloped by

$$y^2-m^2x^2=0.$$

4. If $u=\phi(x, y)$ what is meant by $\frac{d^2u}{dx^2}$, $\frac{d^2u}{dy^2}$ and $\frac{d^2u}{dxdy}$.

Prove that $\frac{d^2u}{dxdy}=\frac{d^2u}{dydx}$.

5. What is *meant* by the symbolic expression

$$(\frac{d}{dx}-a)^{-1}f(x)?$$

Find its values in the particular cases $f(x)=\cos mx$ and $f(x)=\epsilon^{ax}$.

6. If Du stand for $x\frac{du}{dx}+y\frac{du}{dy}$ where $u=f(x, y)$; show that if u be homogeneous and of the nth degree $Du=nu$. By what steps can we ascend to the more general theorem $F(D).u=F(n).u$? Does the proof involve any restrictions on the form of F?

7. Find the equation to a curve which cuts at right angles all parabolas whose equations are $y^2=4Ax$ where A is an arbitrary parameter.

8. Integrate $\frac{dx}{\cos x}$ and $dx \tan^{-1}x$, and evaluate

$$\int_{-\infty}^{+\infty}\frac{dx}{(a^2+x^2)^{\frac{3}{2}}} \text{ and } \int_0^a\int_0^{\sqrt{a^2-x^2}} dxdy\sqrt{a^2-x^2-y^2}$$

9. If $dz=Mdx+Ndy$, where M and N are functions of x and y, what condition must be satisfied? If it be so, how is the equation to be integrated?

E.G. $$dz=\frac{xydy-y^2dx}{\sqrt{x^2+y^2}(x-\sqrt{x^2+y^2})}$$

If M and N do not satisfy the condition, what process could have produced the equation $Mdx+Ndy=0$?

Can you illustrate these cases by a reference to geometry of three dimensions?

10. Integrate the differential equations

$$\left.\begin{matrix} \alpha) & \frac{d^2y}{dx^2}+2\frac{dy}{dx}-3y=0 \\ \beta) & x^2\frac{d^2y}{dx^2}-3x\frac{dy}{dx}+2y=x^3 \end{matrix}\right\}\text{and}$$

$$\gamma) \left\{\begin{matrix} x\frac{dy}{dx}-z=x^3 \\ x\frac{dz}{dx}-y=x^2 \end{matrix}\right\}.$$

11. A bag contains 5 sovereigns and 3 shillings, A and B draw each a coin in succession till the bag is empty. What is the expectation of each?

Appendix, No. 8.

Scholarship Examinations

Logic.—*Examiner, Rev. Dr. M'Cosh.*

1. "Dogs are carnivorous." Interpret this proposition both as to the extension and comprehension of the terms, and put it in the various forms of opposition.

2. State and illustrate the difference between proof and cause. What phrases are used in reference to both?

3. "The innocent person ought not to be punished; but this person ought not to be punished, and it follows that he is innocent." Examine this in the form both of a conditional and categorical, and give the rules and the reasons of the rules for the decision you come to.

4. Is A A I allowable in the first figure? Is it allowable in the second figure? In answering this second question, give the rule and the reason.

5. "None but the good are truly blessed; but those who follow sensual pleasure are not good; and so they cannot be blessed." Put this in proper form. Indicate the figure. Reduce it, and explain what is meant by reduction.

6. Define a fallacy. When is a fallacy most apt to escape detection? Define a material fallacy, and give the principal forms. Examine the following, and say to what head you would refer it:—When Triptolemus Yellowley proposed a two-handled plough, "Tell me," said Magnus Troil, "how it were possible for Neil of Lupness, that lost one arm by his fall from the Crag of Nekbrachan, to manage a plough with two handles?"

7. What is the meaning of the word analysis? What is the process of analysis? What object is secured by analysis? What renders it necessary to resort to this process? What is meant by synthesis? When is synthesis expediently employed?

8. What is the scientific end aimed at in Natural History? What the scientific end aimed at in Natural Philosophy? How do these ends differ from each other?

9. Suppose we were to arrange the plants of the earth into trees, shrubs, and herbaceous plants, what would be the defects of the classification?

10. What is the argument from homology in Natural History? What the argument from teleology? What majors are implied in those two arguments?

11. What is the method of difference? What is its canon? How does it differ from the method of agreement? To what cases is it specially applicable?

12. What is meant by demonstrative evidence? In what departments of investigation can it be had? Why cannot it be had in all kinds of inquiry?

Chemistry.—*Examiner, Dr. Andrews.*

1. What volume will 100 cubic inches of air at 0°C. occupy at the following temperatures, viz.:—100°C., 200°C., and 300°C., the pressure remaining the same?

2. Describe the method of obtaining a vacuum by means of steam,—also by means of carbonic acid.

3. If the tension of the vapour of water at a given temperature be 0·5 in. what change will be produced in a given volume of dry air standing over mercury, by introducing a little water, provided the barometer stand at 30 in. and the pressure be made the same within the vessel before and after the introduction of the water?

4. Is there any analogy between radiant heat and light of different colours?

5. Describe the first and second crystalline systems, and give the expressions for the faces of an octahedron of each system.

6. Describe the reactions which take place when oxygen gas is prepared by the action of sulphuric acid, first on the black oxide of manganese, and secondly, on the bicarbonate of potash.

7. How are nitre beds prepared, and what is the theory of the formation of nitric acid by means of them?

8. Describe the principal properties of chlorine.

9. How is cyanogen prepared, and under what conditions do carbon and nitrogen unite to form that body?

10. Give a general account of the most important compounds of fluorine which have been discovered.

11. What is the composition of gunpowder, and what substances are formed when it explodes?

12. Describe some of the other fulminating bodies or mixtures which are known to chemists.

13. Give a general description of the properties of any two of the following metals, viz.: potassium, sodium, magnesium, barium, aluminium.

14. What are the metals which occur associated with platinum in its ordinary ores?

15. Give some account of the composition of meteoric stones.

16. What are the properties of starch, and how is it converted into dextrine and sugar?

17. State the composition of pyroxylic spirit (methyl-alcohol), how it is obtained, and its relations to ordinary alcohol.

18. Mention the more important acids of the series $C_{2n} H_{2n} O_4$.

19. What is the law of Prout regarding the relations of the atomic weights of the other elements to that of hydrogen, and how has it been recently proposed to modify it?

20. Give an account of the theory of the Leyden Jar.

21. Describe the construction and theory of Groves' battery.

22. Explain the construction and action of the needle electric telegraph.

23. Give some account of the subject of diamagnetism.

Natural History.—*Examiner, Dr. Dickie.*

ZOOLOGY.

1. Give a summary of the influence of light and heat upon the animal functions; illustrate by examples.

2. Describe the modifications of the anterior extremity in Equidæ, Cheiroptera, and Aves.

3. Describe the organs and modes of locomotion in Ophidia and Pisces.

4. State the position of Quadrumana, Ruminantia, Cheiroptera, and Rodentia, in Professor Owen's classification of Mammalia.

5. State your idea of the Articulate type of structure; illustrate by examples.

6. Describe the modifications of the organs of vision in Invertebrata.

7. Refer the following to their places in the system of classification—Elephas, Canis, Hirundo, Gadus, Rana, Hirudo, Tænia.

BOTANY.

1. Describe the structure of Stomata; state on what organs they occur; mention also their functions.

2. Explain the terms Polysepalous and Gamosepalous; state the methods of ascertaining the numerical constitution.

3. Describe the parts of a simple ovarium, and state their homologies.

4. Institute a comparison between the embryos of Endogens and of Exogens.

5. Why are certain plants called Thalamifloræ? Mention four examples of such, natives of Ireland.

6. State the characters, properties, and general distribution of Cruciferæ, and mention four plants belonging to the order.

7. Refer the following to their places in De Candolle's system—Ranunculus, Rosa, Primula, Pinus, Polypodium, Equisetum.

Natural Philosophy.—*Examiner, Dr. Stevelly.*

MECHANICS AND HYDROSTATICS.

1. Explain the reason why subjects in Mechanical Philosophy are divided into the branches of Statics and Dynamics.

2. Explain what is meant by "work done," and how it is measured.

3. Explain what is meant by the centre of gravity of a body, and show that every mass of matter must have a centre of gravity.

4. Where is the centre of gravity of a heavy pyramid of uniform density?

5. Explain the construction and principle of the Danish Balance.

6. Enunciate the proposition which enables us to calculate the power of the screw, and explain how its truth is proved.

Appendix, No. 8.

Scholarship Examinations

7. When is a system of Pulleys called a Burton? Describe the two systems of Burton's, first and second kind.

8. Show that in the funicular polygon the tensions of the several parts of the string which form the polygon are proportional to the secants of the angles which they make with the horizon; and that the weights suspended at its angles are proportional to the sums of the cotangents which the parts of the string which meet at them form with the vertical.

9. Explain what is meant by the velocity, at any instant, of a body whose velocity is continually changing.

10. In the investigation of the action of uniform or constant forces we meet the formula $v^2=2fs$. Explain its terms, and show how it is deduced.

11. Show that the free surface of a heavy fluid must at every part be perpendicular to the direction of gravity when undisturbed. What is the general principle?

12. Enunciate the proposition which states the pressure of a heavy fluid of uniform density upon a plane surface placed beneath it; and give the proof.

13. If the earth had no diurnal or rotatory motion what would be the general shape of the surface of the waters on its surface? and explain how that motion modifies its shape.

14. Explain what is meant by the elastic force of a gas or air, and how it is estimated or measured.

15. By what experiment is it shown that atmospheric air has weight? and how is its specific gravity to water unity determined? State the result as given by Galbraith and Haughton.

16. Explain the following experiment:—If I fill a tube closed at one end, or any vessel with water, and immerse it with its open mouth downwards in a vessel of water; if I now draw it out of the water by degrees, a certain length of it will remain full of water as long as its open mouth is immersed beneath the surface of the water in the larger vessel. State the limit to the length that will remain full.

ENGINEERING SCHOLARSHIPS.

SECOND YEAR STUDENTS.

MINERALOGY AND GEOLOGY.—*Examiner, Professor Wyville Thomson.*

1. What are the principal ores of iron?

2. Under what circumstances does black-band ironstone occur; and what is its chemical and physical composition?

3. By what process is pig-iron produced from black-band iron ore?

4. What are the principal Swedish iron ores?

5. What are the principal ores of silver?

6. In rocks of what formation is gold chiefly found; and in what form does it occur?

7. What is meant by anticlinal and synclinal axes?

8. Of what formations are the following fossil genera characteristic:—*Pentacrinus, Pentremites, Graptolites, Paradoxides, Cephalaspis, Trinucleus?*

9. Name and describe some of the principal minerals of the hornblende series.

10. What crystalline form is bounded by planes truncating symmetrically the solid angles of—

1st. A cube.
2nd. A rhombic dodecahedron.

11. What is the property of all crystals which distinguishes them from polyhedra in general?

CIVIL ENGINEERING.—*Examiner, Professor James Thomson,* A.M., C.E.

1. In the annexed system of triangles* for a survey some of the measurements are in error. Find by check calculations which of them are right, and which wrong; and correct those which are erroneous.

2. Give an example of a field-levelling book containing at least eight fore-sights; work out the reduced levels with reference to an assumed datum, and give all the proper checks on the accuracy of the arithmetical work.

3. A chain, on being compared with a standard, is found to be ¾ of a link too long. A survey is made with this chain, and the area, computed as if the chain were correct, comes out 1037A. 2R. 14P. Find the correct area from the above data.

4. Compute the area due to the offsets in the following portion of a field-book:—

0			0	8	4	12	5	0					
910	750	670	550	400	300	250	180	100	60	45	20	20	0
0	30	25	0					0	52	52	12	8	6

5. Describe the manner in which an image of the object viewed with a theodolite or levelling instrument is formed in the focus of the object glass; and explain the adjustment of the instrument for parallax.

6. The features of a tract of country may be given by a map accompanied by a set of sections, or they may be given by a contour map. Contrast the two methods, showing in what respect the contour map indicates the features in a more intelligible manner than the other does, and in a manner peculiarly well adapted to facilitate the laying out of any works such as those for drainage.

7. In Butler Williams' Practical Geodesy the line of collimation of a theodolite is defined, and its adjustment described, as follows:—The line of collimation is "a line passing through the point of intersection of the cross wires fixed in the focus of the object and eye-glasses, and the centres of those glasses." "The adjustment consists in making this line of collimation to coincide with the axis of the cylindrical rings in which the telescope turns." Is this a good and correct definition and description? If not so, give more correct statements on the subject.

8. Compute the area of the entire enclosure shown, surveyed in the accompanying leaf of a field-book,* and give checks applicable to the principal parts of the field-work, and of your calculation.

9. Find how many square yards there are in 2A. 3R. 4P.

10. Give a general rule to determine the mode of reading a vernier.

11. Give the readings of the two verniers of the horizontal limb of the theodolite before you for the position at which the limb is clamped.

12. State the modes of resolving a plane triangle in two cases: 1st. When two sides and the contained angle are given; and 2nd. When the three sides are given.

13. Is it correct, and in close accordance with the indications afforded by the levelling instrument, to define points at the same level, as being those which are equally distant from the earth's centre? If not, give a more correct explanation of the subject.

14. For what use is the pantagraph adapted? Describe its construction, and explain the principle on which it depends.

AGRICULTURAL SCHOLARSHIPS.

NATURAL HISTORY.—*Examiner, Dr. Dickie.*

BOTANY.

1. State the nature of the bulbs of Onion and Crocus; describe also their structure.

2. Explain what is the meaning of the expressions, superior and inferior flowers; give examples.

3. Refer Gramineæ and Cruciferæ to their places in the system, and state any common Agricultural plants belonging to these orders.

ZOOLOGY.

1. State the microscopical characters of the blood in Vertebrata.

2. State the modifications of the limbs in the Horse and Ox.

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* Diagram furnished to the students at the examination, but not here printed.

* Leaf of field-book furnished to students at examination, but not here printed.

Appendix, No. 8.

Scholarship Examinations

3. Enumerate the species of Vertebrata in a state of domestication, and refer them to their places in the system of classification.

4. State any Articulata which yield products useful to man; mention the classes and orders to which they belong.

Mathematics.—*Examiner, Professor Tait.*

Arithmetic, &c.

1. Divide 74125 by 125. Show that every number ending with 000, 500, 250 or 125 is divisible by 125.

2. Reduce $\frac{1}{3}+\frac{1}{6}+\frac{3}{14}+\frac{5}{56}$ to a decimal fraction.

What decimal of a cwt. is 3qrs. 7lbs.

3. Give rules for the multiplication and division of decimals, and divide 3·15 by ·00126.

4. Extract the square roots of ·16, ·016, and ·16, and the cube root of ·000001728.

5. If 14520 copies of a paper be printed, each copy consisting of 6 sheets, and each sheet be $3\frac{1}{2}$ feet long by 2 feet broad, how many acres will one edition cover?

6. A reservoir is 18 feet 6 inches long by 12 feet 9 inches wide, how many cubic feet of water must be drawn off to make the surface sink $1\frac{1}{3}$ feet.

7. Find the simple interest of £330 for 7 months, at $3\frac{3}{4}$ per cent. per annum.

8. If a bill of £338 6*s.* 8*d.* is due in 9 months, what would be the payment in ready money? (money being worth 3 per cent. per annum.)

9. 3 men working 11 hours a day can reap 20 acres in 11 days; how many men working 12 hours a day will reap a field 360 yards long and 320 yards broad in 4 days?

10. Give the approximate content in acres of

1st. A field in the form of an equilateral triangle and a furlong in the side.

2nd. A triangular field whose sides are 800, 700, and 500 yards.

3rd. A circular field whose diameter is 530 yards.

11. Calculate approximately the content in cubic feet of

1st. A cylindrical stack 15 feet high and 16·5 feet diameter.

2nd. A conical stack $13\frac{1}{2}$ feet high and $13\frac{1}{3}$ feet diameter at the base.

3rd. A boiler in the form of a segment of a sphere 3 feet deep and 5 feet diameter of rim.

Senior Scholarships.

History and English Literature.—*Examiner, Professor Craik.*

Modern History.

1. Sketch the history of the prosecutions of Eliot, Holles, and their associates, in the reign of Charles I., adding what further proceedings took place in regard to them at a later date.

2. Give a rapid account, without entering into legal arguments, of ship money, and the prosecution of John Hampden.

3. Sketch the career and fate of Lord Strafford.

4. Describe generally the course of government pursued by Charles I, in the interval between the dissolution of his Third Parliament and the meeting of the Long Parliament, interspersing facts and dates so far as may seem necessary.

5. Enumerate the chief proceedings of the Long Parliament, and statutes passed by it, before the breaking out of the Civil War.

6. Give an account, with dates, of the King's attempt to seize the Five Members.

1. Explain the new law that was passed after the Wars of the Roses, relating to acts done under a King *de facto*, giving its exact date.

2. Give an account, with the dates, of the two remarkable acts passed in the reign of Henry VIII. for regulating the succession to the Crown.

3. Give an account of the treatment, under Henry VII., Henry VIII., and Edward VI., of the Earl of Warwick, the Earl of Suffolk, the Duke of Buckingham, the Earl of Surrey, the Duke of Norfolk, Lord Seymour, and the Duke of Somerset, or of any one or more of them, stating who they were, and what were the offences with which they were charged.

4. Describe the general character of the government of Queen Elizabeth.

5. State what took place with regard to the subject of monopolies towards the close of the reign of Elizabeth.

6. Explain the Privilege cases of John Storie, and of Arthur Hall.

7. Explain how the question of the succession to the Crown on the death of Elizabeth was affected by the will of Henry VIII.

8. State distinctly the succession of Parliaments throughout the reign of James I. by giving the date of the calling and dissolving of each of them.

9. Give an account of the case of Bates, and of the parliamentary proceedings to which it led.

10. Sketch rapidly the principal proceedings of James's Third Parliament.

11. State the succession of Parliaments in the reign of Charles I.

12. Relate the history of the Petition of Right.

Mathematics.—*Examiner, Professor Tait.*

1. Investigate the expression for the general term of

$$(a_0+a_1+a_2+\dots\dots\dots+a_m)^x.$$

2. Show that an odd number of real roots of $f(x)=0$ lies between each pair of roots of $f'(x)=0$. What supposition is made about the form of $f(x)$?

3. Investigate the exponential expressions for $\sin\theta$ and $\cos\theta$. Apply them to show that

$$x\sin\theta+\frac{x^2}{1.2}\sin 2\theta+\frac{x^2}{1.2.3}\sin 3\theta+\dots\dots\text{to infinity}=\varepsilon^{x\cos\theta}$$

$\sin(x\sin\theta)$.

4. Define the term "spherical excess," and show that if the sides of a spherical triangle be small, each of its angles is greater than the corresponding one of the plane triangle with equal sides by approximately $\frac{1}{3}$rd of the spherical excess.

5. Supposing $\alpha=0, \beta=0, \gamma=0$ to be three equations to straight lines in the form $x\cos\alpha+y\sin\alpha-p=0$; interpret the equation $\alpha^2-k\beta\gamma=0$, and find the general equation to a tangent to the locus it represents.

6. Given the perimeter of a sector of a circle, find its angle when its area is a maximum.

7. Trace the curve whose equation is $r=a\cos 2\theta$, and find the whole area of the curve $r=a\cos m\theta$ (m a positive integer.)

8. Evaluate $\int_0^{\frac{\pi}{2}}(\sin\theta)^m d\theta$ (m a positive integer.)

9. If a surface be generated by the revolution of a circle about a line in its plane, a tangent plane drawn from the foot of the perpendicular on the axis from the centre of the revolving circle, cuts the surface in two circles. Hence the same surface may be generated by another circle revolving about an axis inclined to its plane.

10. What are common to all surfaces represented by $\frac{x^2}{a^2+\alpha}+\frac{y^2}{b^2+\alpha}+\frac{z^2}{c^2+\alpha}=1$, where α is an arbitrary constant?

11. Sum x terms of $u_x=\frac{1}{x(x+1)}$ and integrate $u_{x+2}-3u_{x+1}+2u_x=0$.

12. Deduce from general considerations the partial differential equation to conical surfaces, and integrate it.

13. Find the form of the surface of revolution which with given volume has the least surface.

14. Find the values of e, f, g (independent of x, y, z) so that if ex be written for x, fy for y, and gz for z, the equation

$$\frac{a^2x^2}{a^2-r^2}+\frac{b^2y^2}{b^2-r^2}+\frac{c^2z^2}{c^2-r^2}=0 \text{ (where } r^2=x^2+y^2+z^2\text{)}$$

may become $\frac{x^2}{1-a^2r^2}+\frac{y^2}{1-b^2r^2}+\frac{z^2}{1-c^2r^2}=0.$

MEDICAL SCHOLARSHIPS.

PRACTICAL CHEMISTRY.—*Examiner, Dr. Andrews.*

1. Describe the different methods of determining the specific gravity of a liquid.

2. What reagents are employed to distinguish the several groups of bases from one another; state also fully how they are employed for this purpose.

3. Describe the method of distinguishing and separating lime, magnesia, and potash.

4. What are the characteristic properties of the oxalate and of the phosphate of lime?

5. Give some account of the application of the blowpipe to the discrimination of the bases from one another.

6. How are the oxides of copper, Cu_2O and CuO, prepared, and to what uses are they applied in chemical analysis?

7. Give an account of the tests of lead, and of the method of applying them to a water supposed to have attacked a leaden cistern.

8. Describe carefully the properties of the arsenious acid and the action of liquid tests upon it; state also its composition and mode of preparation.

9. What are the characteristic reactions of the oxalic and formic acids?

10. Give an account of the uric acid and cystic oxide calculi.

MATERIA MEDICA.—*Examiner, Dr. Reid.*

1. How are anthelmintic medicines classified?

2. Enumerate the medicines belonging to each class.

3. Mention an alkaloid contained in one of them; the proof of its being absorbed; the locality in which it is absorbed; and the reason of its being absorbed there.

4. State the kind of worm each is most useful against.

5. Write a prescription for each medicine, with the doses for an adult and for a child.

6. Name the six principal Hydrogogue Cathartics of vegetable origin.

7. State the officinal preparations of each.

8. What is the nature of the active principle of each?

9. Mention the diseases they are exhibited in.

10. Write a prescription for the use of each.

11. Which of them is improved by being worm-eaten, and how?

12. Name the thirteen medicines on the table, and classify them therapeutically.

NATURAL PHILOSOPHY.—*Examiner, Dr. Stevelly.*

PHYSICS.

1. When three forces equilibrate, prove (1) that their directions must meet at the same point, (2) that they must act in the same plane, and (3) that they must bear to each other the proportion of the sides of a triangle drawn parallel to their directions.

2. What forces will equilibrate on a wheel of eight feet diameter connected with an axle of five inches radius?

3. Explain why the water does not fall out when a glassful is whirled round at the end of a string, although at each revolution the mouth of the glass must be turned downwards.

4. By what experiment is it best shown that the power of gravity at a given place to produce velocity, is the same for the most dissimilar kinds of bodies?

5. Explain why a vessel, if loaded in a port where the water is salt, so deeply as to bring her gunwale to the water, will sink if taken up a fresh-water creek or river.

APPENDIX, No. 8.

Scholarship Examinations

6. Describe the method and explain the principle of taking the specific gravities of cohering masses.

7. Thirty inches depth of Mercury whose specific gravity is 13·6, produces a pressure of 14·71lbs. on each square inch of surface on which it rests. How many feet deep of water will produce a pressure of 16lbs. on each square inch?

8. State some of the experiments by which the elasticity of airs or gases is demonstrated, and explain the law which governs elasticity, and how it is determined.

9. Explain the principle of the Parachute or machine by which a person may safely detach himself from a balloon while aloft in the air, and descend gently to the earth.

10. Describe the manner in which sounds are generated and propagated, and explain the difference between noises and musical notes.

11. Explain the principle on which Photometers are constructed, and describe some of the most approved kinds.

12. Give a general description of the coats and humours of the eye, and its optical functions in enabling us to see.

13. Describe the maximum and minimum self-registering Thermometers: and point out where a knowledge of the principles of capillary action is necessary for understanding their use.

14. Explain what is meant by the latent heat or heat of fluidity of water; how its amount is determined; and its important use in the economy of nature.

15. Explain what is meant by a body becoming electrified by induction, and describe its leading phenomena.

16. Describe the manner in which Daniell rendered the voltaic battery constant in its action; and explain the differences between his, Groves,' and Bünsen's batteries.

17. Describe the phenomena of attraction and repulsion as exhibited by magnets: explain why soft iron is never repelled by either pole of a permanent magnet.

PRACTICE OF MEDICINE.—*Examiner, Professor Ferguson.*

1. What are the characteristics of the Fever designated Typhus; its ordinary complications; and the indications of their treatment?

3. State the symptoms and signs that would lead you to diagnose the *first* stage of Phthisis; what Pathological condition of the lungs constitutes it; and give full directions for the treatment of such a case.

3. Give the phenomena of a paroxysm of Hysteria; its principal causes, moral and physical; and how to diagnose it from Epilepsy.

4. Enumerate the various causes productive of perforation of the intestine; the most likely means of preventing its occurrence; and your Prognosis.

5. State all the diseases likely to be confounded with Pleuritis, and the means of diagnosing each.

SURGERY.—*Examiner, Dr. Gordon.*

SURGICAL ANATOMY.

1. Enumerate the bones of the foot, and describe their relative positions, mentioning those processes which can be felt, and which serve as a guide in determining the precise situation of the joints in the various amputations.

2. Mention the textures divided in the operation of tying the external iliac artery; and also the collateral branches which afterwards chiefly contribute to the restoration of the circulation.

3. Describe the origin, course, distribution, and functions of the 5th pair of nerves, as well as the diseases which induce facial neuralgia.

4. Describe the operation of tying the common carotid artery, the parts exposed in the operation, and its effects on the brain.

5. In excision of the half of the lower jaw, mention the parts that must necessarily be divided and exposed in the operation.

LAW SCHOLARSHIPS.—*Examiner, Professor Leslie.*

JURISPRUDENCE.

1. What is meant by Public and Private Law, respectively, and what is their relation to each other according to Lord Bacon?

2. Explain the maxim, "Optima est lex quæ minimum relinquit arbitrio judicis."

3. "As an exception strengthens the force of a law in cases not excepted, so enumeration weakens it in cases not enumerated." Explain the principle on which this maxim is founded.

4. Explain the distinction between *Jus* and *Lex*, and cite parallels from other languages.

5. What is the essential difference between coercive Laws and Ethical Rules?

6. State the different meanings of the term Jurisprudence, and define it, considered as a branch of Social Science.

7. State concisely, with dates, what you know of the juridical works of Grotius, Leibnitz, Bentham, and Savigny.

8. State concisely the substance of Dr. Reddie's account of the cultivation of Law by the Greeks and Romans respectively.

9. Define "Law" and "Legal Right."

10. How was the natural progress of opulence diverted by the feudal laws according to Adam Smith?

11. "The introduction of the feudal law may be regarded as an attempt to moderate the authority of the great allodial lords" (Wealth of Nations, Book III. Chap. IV.) What reason does Adam Smith give for this statement?

12. "It is a mistake to imagine that the territorial jurisdiction of the feudal proprietors took their origin from the feudal law?" Is this true or not, and why?

CIVIL LAW.

1. Trace the principal events in the history of the Roman Law from the expulsion of Tarquin to the death of Justinian.

2. Trace the principal events in the history of Roman Law in Continental Europe from the death of Justinian to the 16th century, and explain the mode of its preservation during the interval between the fall of the Empire and the 12th century.

3. How do you account for the influence of the laws of Rhodes upon the maritime and commercial laws of the Romans?

4. How do you account for the influence of the maritime and commercial laws of Rome upon the laws of modern Europe relating to maritime commerce?

5. (*a*) How is the preference by the Romans of the contracts of bottomry and respondentia to maritime insurance to be accounted for?

(*b*) How is the converse state of facts in Great Britain to be explained?

6. Write a short account of the principal events in the history of the Civil Law in England.

7. Show that principles of Roman Law have been adopted to a large extent into the English system of Equity, and account for the fact.

8. Point out the principal merits and defects in the system of law contained in the Corpus Juris Civilis.

9. State the different modes of acquiring property, with a particular explanation of the doctrine of *accessio*, and examples.

10. Explain the law of *Emphyteusis*.

11. Explain the law of *usucapio*.

12. Explain *dominium* and *possessio*.

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